With its concentration on geometrical form, Islamic art and architecture offers a very rich source of wonderful patterns to study and to investigate. The original inspiration for this book came from visits to the buildings of Moorish Spain, in particular to those of Granada, Cordoba and Seville. This striking introduction to Islamic design was followed by journeys to the traditional sites of the Middle East and North Africa and then finally to some of the newer mosques of Great Britain.

Everywhere there was a wealth of pattern and inventiveness to marvel at. The sense of wonder increased still further when, on starting to draw the patterns for myself, I discovered the simplicity of the grids from which they were developed. It is hoped that this book, with its combination of drawings and photographs, will stimulate a thorough investigation and interest in the wonderful geometrical patterns and buildings of Islam.

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1- Sanat, İslam
Dekorasyon ve süsleme,
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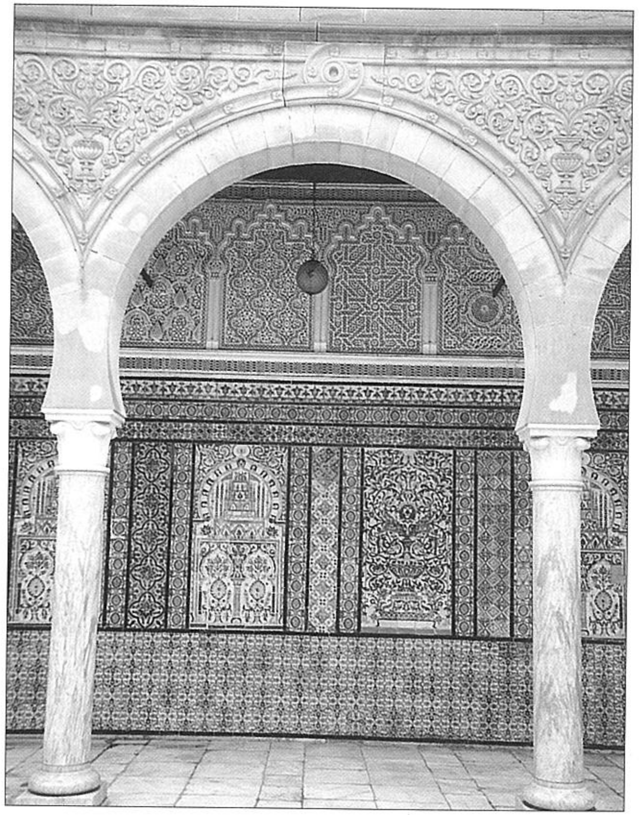
Cover: The Dome of the Rock, Jerusalem
Opposite: Barber's Mosque, Kairouan

Demirbaş Kayıt No: 44916-

Geometric Patterns from Islamic Art & Architecture

Robert Field



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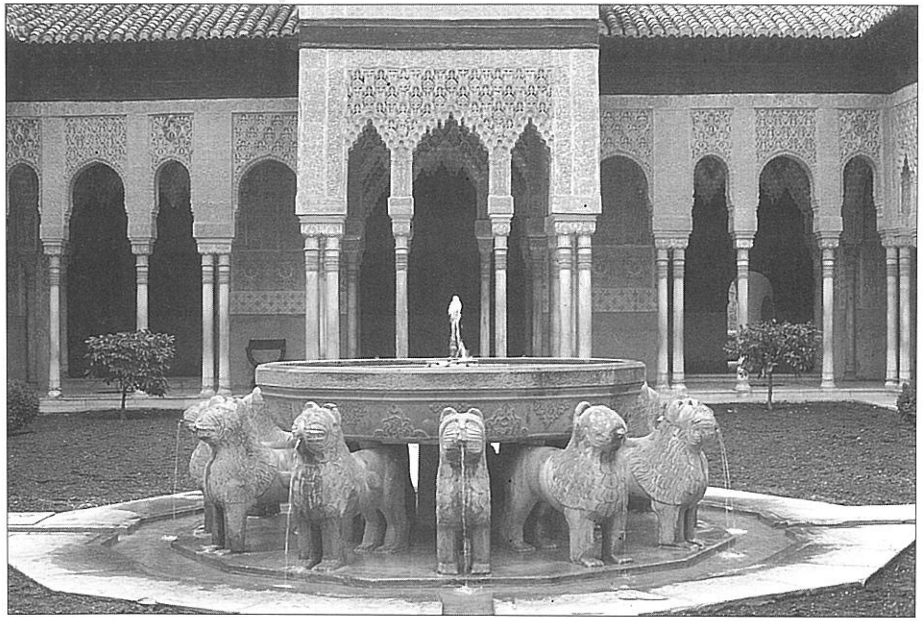

The Alhambra, Granada

I have given the origin of many of the patterns by stating where I first came across them. However, many patterns occur throughout the Islamic world and they can also be found expressed in different ways and in different materials. For example, the same pattern may be discovered in a delicate manuscript painting or as part of a floor or wall decoration made from glazed tiles, stucco or sometimes even carved wood. Certain patterns may also appear in the form of pierced brick walls or as glazing bars for windows. I am especially grateful to Dr. Patricia Witts for photographs and information on places that I have not yet been able to visit so that they can also be included in this collection.

All photographs and illustrations in this book are by the author with the exception of the following: Page 4, The Alhambra, Mike Castle. Page 28, Sana'a, Yemen and Page 41, Rabat, Morocco, Dr Patricia Witts. The author wishes to thank them for granting permission for their photographs to be included.

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PROF. DR. HASAN GÜRBÜZ KÜTÜPHANESİ
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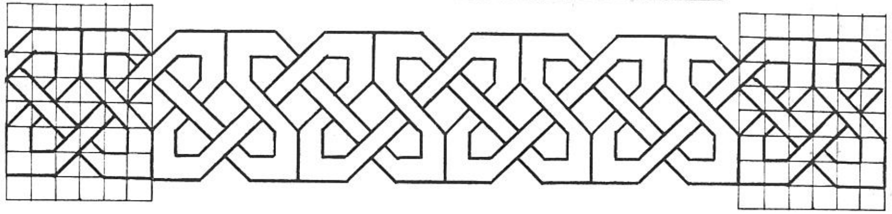


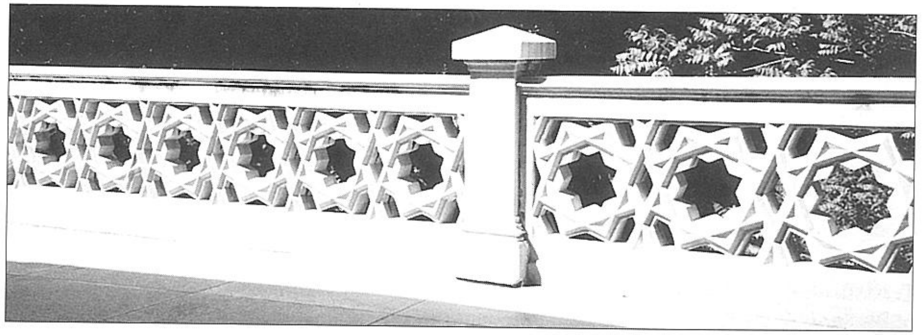
> "The mind that constantly applies itself to geometry is not likely to fall into error."
>
> Ibn Khuldun

For many years now, I have been interested in all aspects of pattern, design and symmetry and my first real encounter with Islamic art came on a trip to Southern Spain where I saw and explored the Moorish architecture which still survives there in such abundance. The tiled and stucco patterns in the Alhambra Palace in Granada and the Alcazar in Seville, I found quite stunning: the sort of experiences from which it is hard to recover. The other great revelation was entering the Great Mosque in Cordoba and standing open-mouthed and astonished within a forest of columns capped by wonderful horseshoe-shaped arches in red and white. Since then I have visited many Islamic sites and buildings elsewhere, but this early flowering of Islamic culture in Southern Spain still holds me in wonder and amazement. As a result you will find many examples in this book which come from this source.

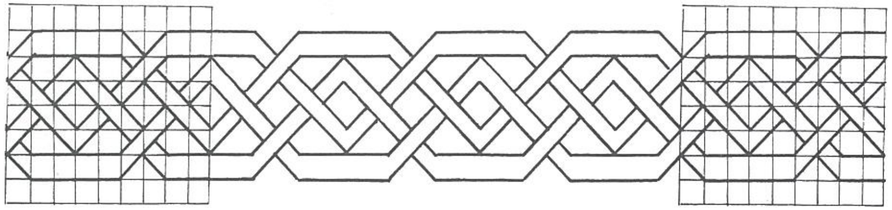
The aim of this book is to enable the reader to recreate and as a result thoroughly appreciate some of the wonderful Islamic patterns that there are. In the interests of practicality I have restricted myself to those kinds that can be drawn using squared or isometric paper. For most of them, the underlying grid is clearly shown.

I hope that you derive as much pleasure from them as I have gained in researching and compiling this collection.

Robert Field

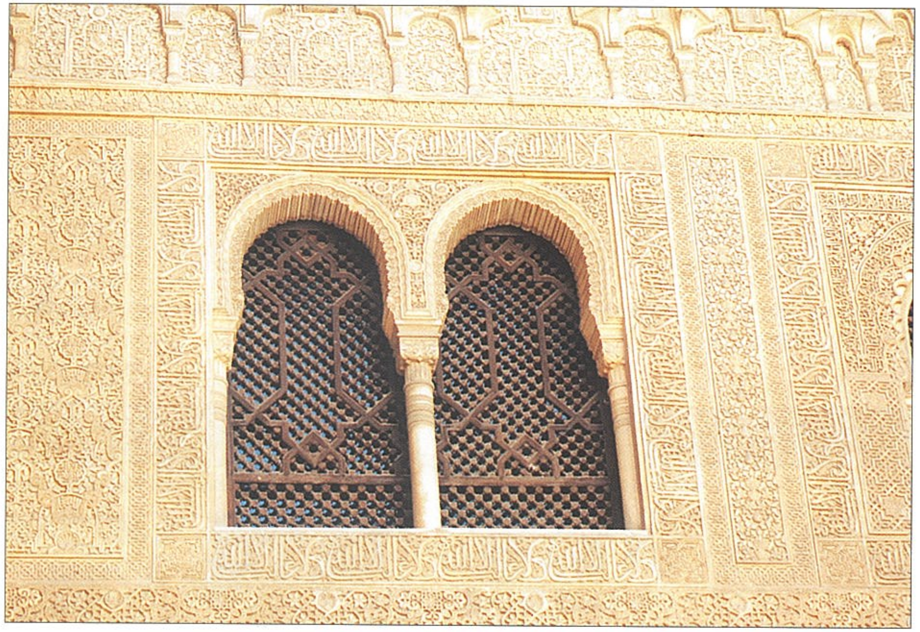


Topkapi Palace, Istanbul



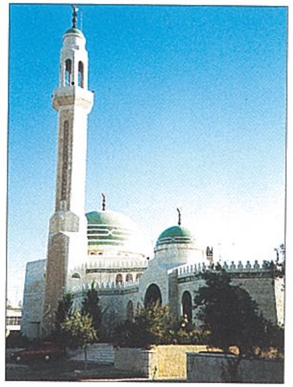
No-one knows when the portrayal of human and animal forms was forbidden for the decoration of mosques and religious buildings but it seems to have come into force very early on in the history of Islam. This ban was not backed up by any quotation from the Qu'ran (Koran), but it has been rigorously maintained.

The outstanding richness of Islamic art lies in the complex use of geometrical pattern. It is evident that many of these patterns have their origin in the previous cultures that once dominated these lands - Greek, Roman, Byzantine, Central Asian and Persian, but the Islamic craftsmen soon developed a distinctive style and have, over the years, discovered and devised ever more complex patterned schemes. The buildings of the Islamic world are a delight of geometry, with ingenious patterns covering the walls, ceilings, floors and windows and also much of the furniture within the rooms.



The Alhambra, Granada

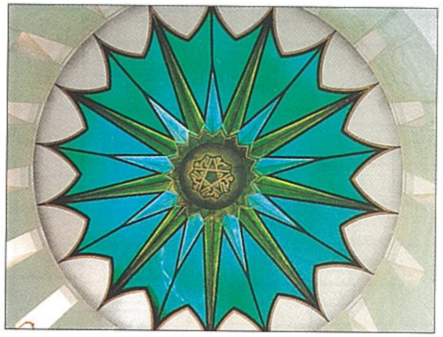
Texts from the Qu'ran are also important and the use of calligraphy and the abstraction of the written text to a decorative pattern can often be seen, especially over archways, windows and doors.



Amman, Jordan

The word mosque comes from the Arabic word *masjid*, meaning 'a place of adoration' The most holy mosque of Islam is the Haram at Mecca. This building is open to the sky, but most mosques do have roofs, often in the form of domes. The Dome of the Rock in Jerusalem which is illustrated on the front cover shows a typical early example. In addition, there are usually *minarets*, tall slender towers from which the faithful are called to prayer.

Within the mosque there is the *mihrab* or alcove in the wall facing Mecca which directs the prayers of the faithful towards the birthplace of the Prophet. Nearby is the *minbar* or pulpit from which sermons are given.



Central Mosque, Glasgow

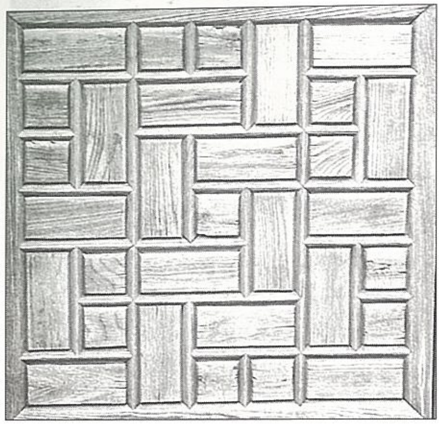
The Alhambra, Granada

Great Mosque, Cordoba

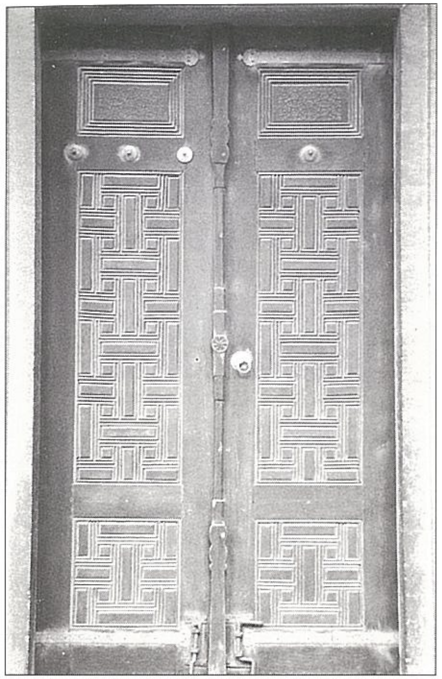
King Abdullah Mosque, Amman

Within the general pattern for the design of a mosque there is enormous variety and inventiveness, with each architect introducing special features and decorations. This continues in the many new mosques which are being constructed today all over the world, including some here in Britain.

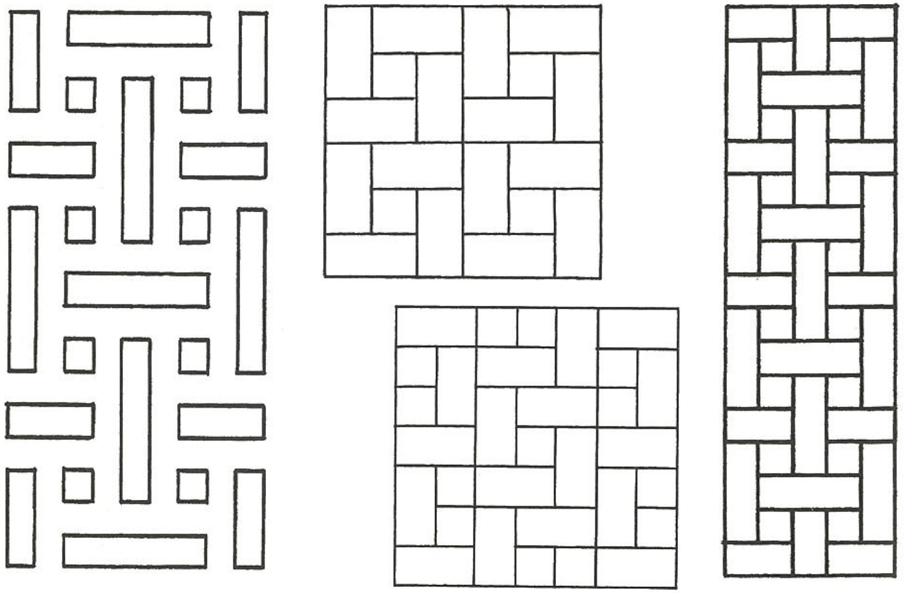
Amid the complex geometrical patterns there are simpler ones like these which include only squares and rectangles. The inspiration for these designs was most probably woven basket work but they are mostly seen as panels of heavy doors, constructed from substantial wooden blocks.



Süleymaniye Mosque, Istanbul

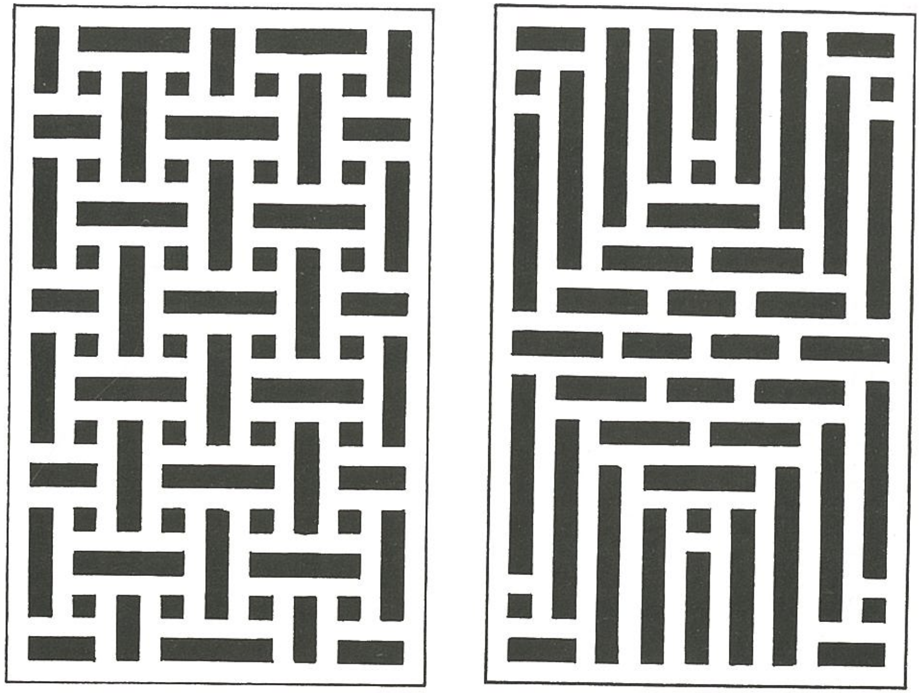


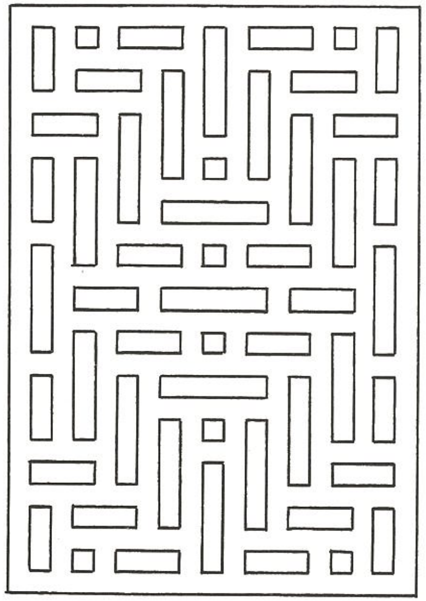
Süleymaniye Mosque, Istanbul



These designs all come from doors in the Süleymaniye and Blue Mosques in Istanbul.

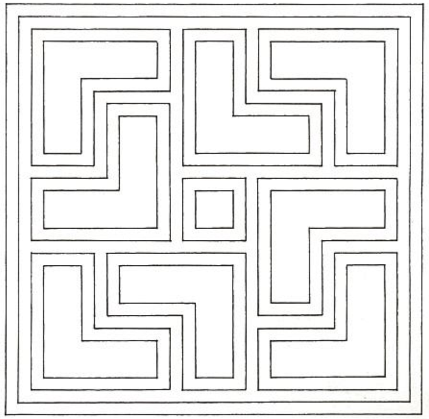
Two patterns from a pierced marble screen in the Jami' Mosque at Ardistan in Iran.



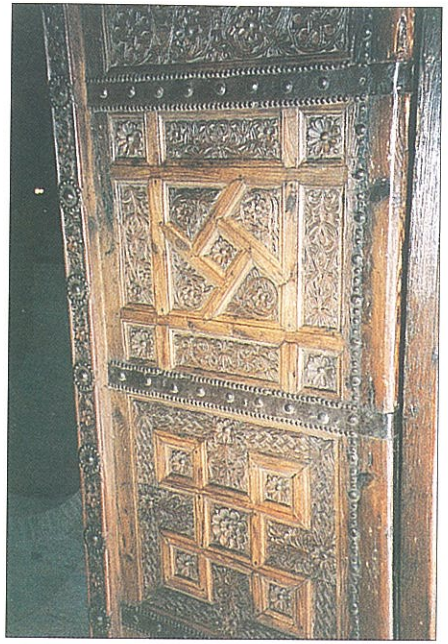


The pattern on the left is from a wooden shutter at the Azem Palace in Damascus.

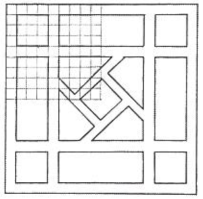
This arrangement of L shapes around a central square comes from a stucco decoration in Samarra in Iraq.

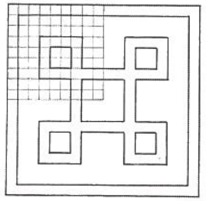


Sometimes a small central square is turned through 45° within a larger square. Here it is used for the upper panel of a two-panel door. Note that both designs are developed from the same square grid to maintain the sense of scale and proportion.

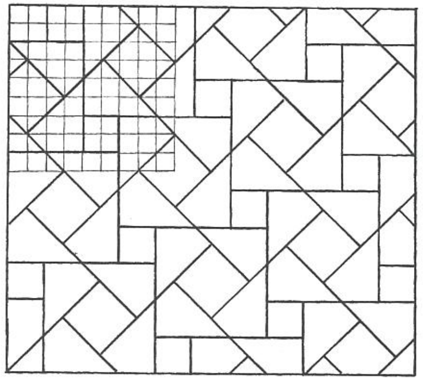


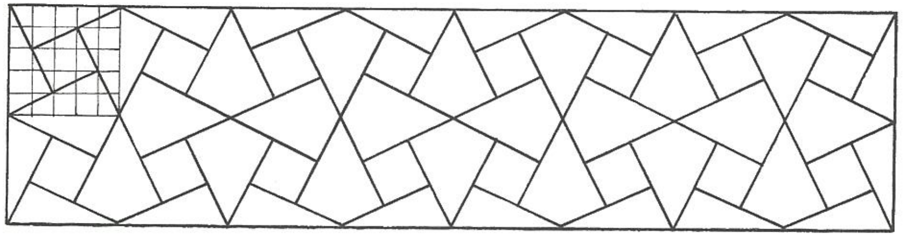
Sidi Oqba Mosque, Kairouan, Tunisia



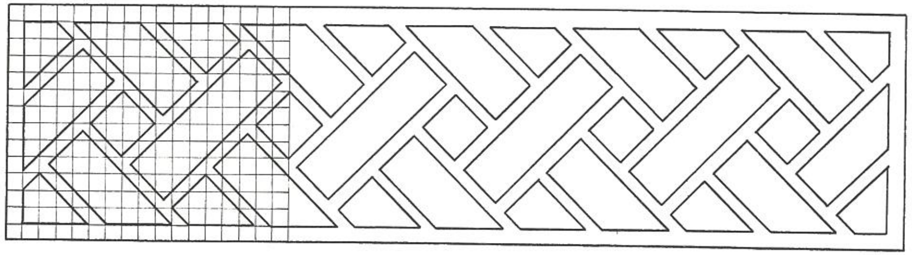


The two metalwork designs below illustrate other ways in which the rotated square idea is used, first in Yemen and then in Syria.

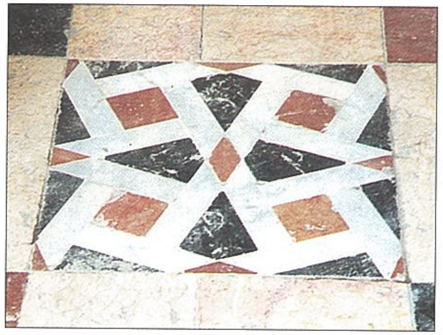




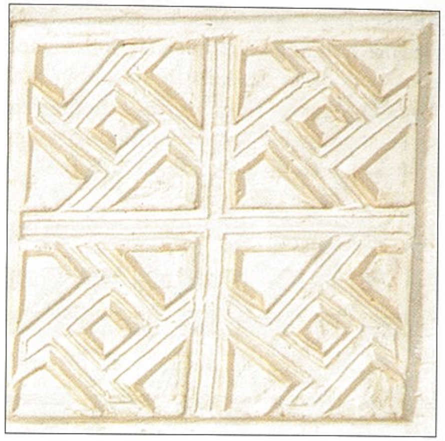
The pattern below is from a carved wooden shutter in the Azem Palace in Damascus.



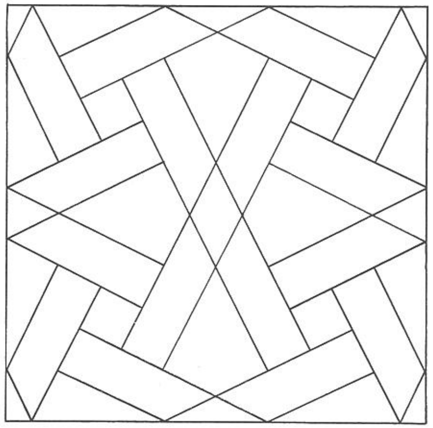
These patterns, all from the Azem Palace in Damascus, show how this motif and its mirror images can be developed.

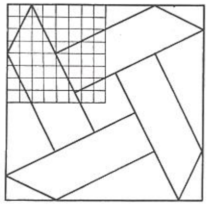


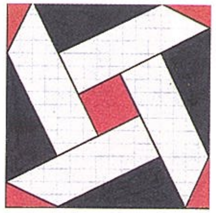
Azem Palace, Damascus

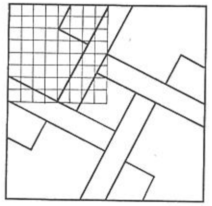


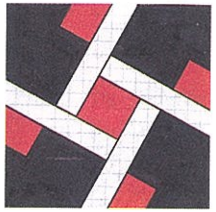
Azem Palace, Damascus

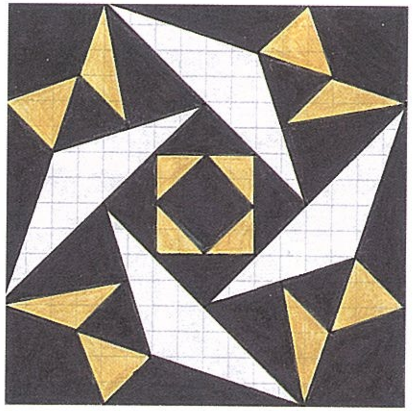


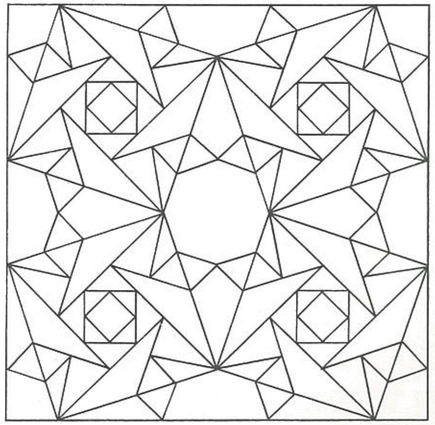




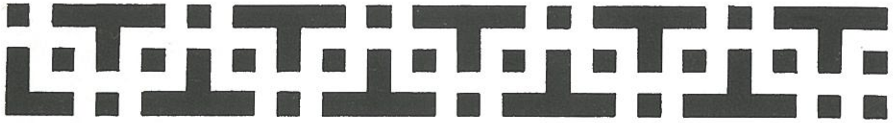


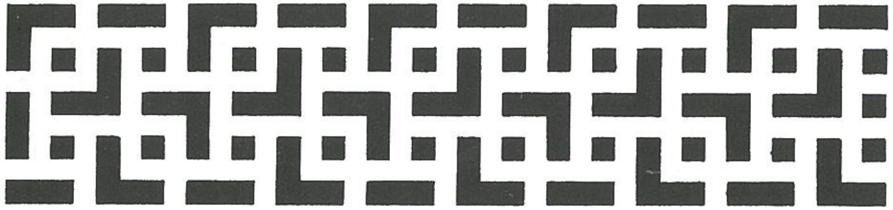




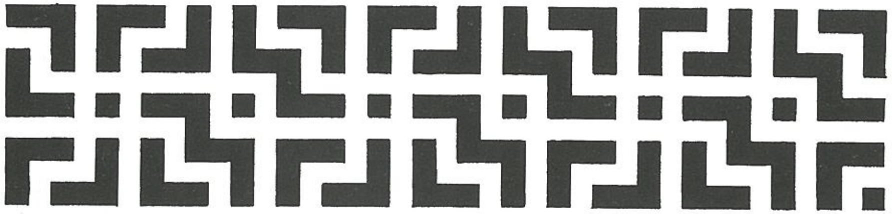


Another important source of inventive patterns which include only squares and rectangles are buildings with facades constructed from rectangular bricks. Such ornamental brickwork casts shadows in the strong sunlight and the patterning enlivens the whole structure. Iran is rich in such examples and the brick buildings of the Seljuk period are especially notable for the multiplicity of design ideas. The following four pages will show just how diverse and exciting these patterns can be.

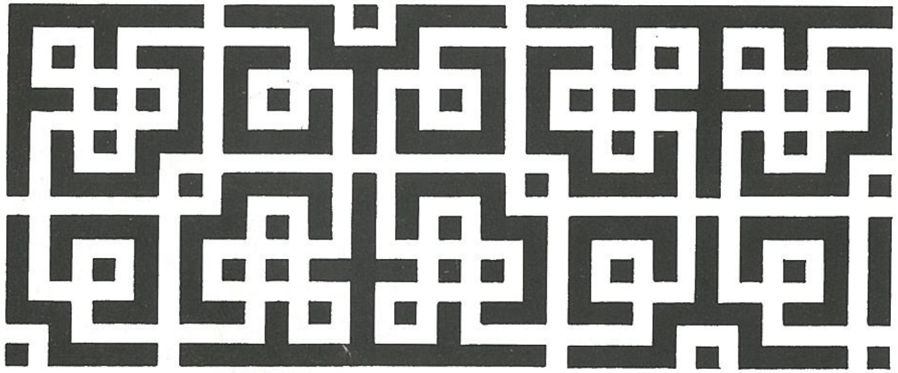


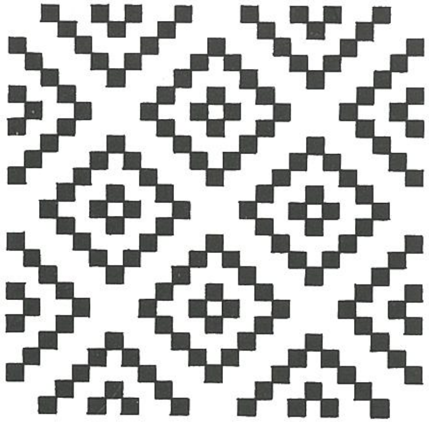


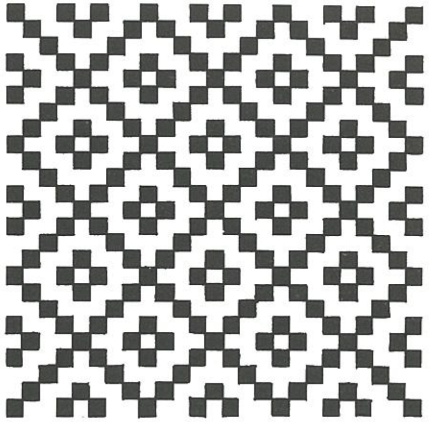
The two patterns above and the one at the foot of the page come from Damghan in Iran.

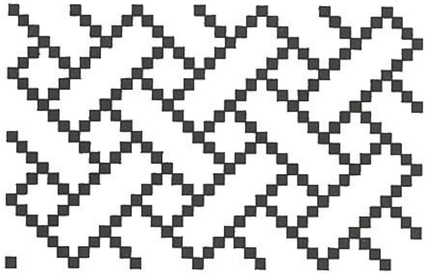


This pattern comes from Simnan in Iran.



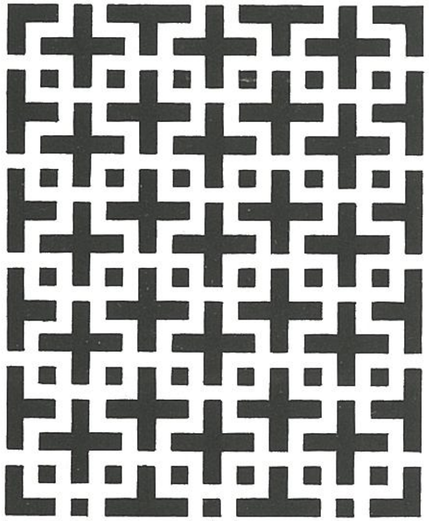


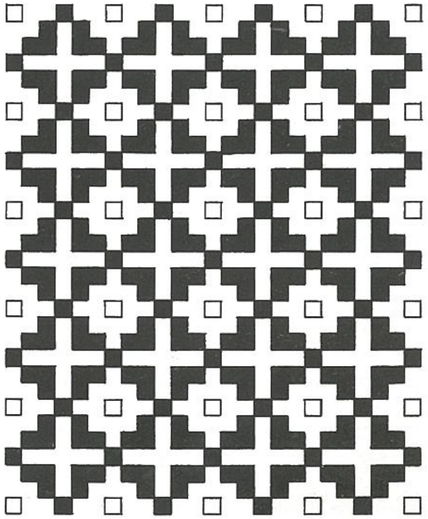




The upper three patterns are from the ruins of the Mosque at Haftshuya in Iran.

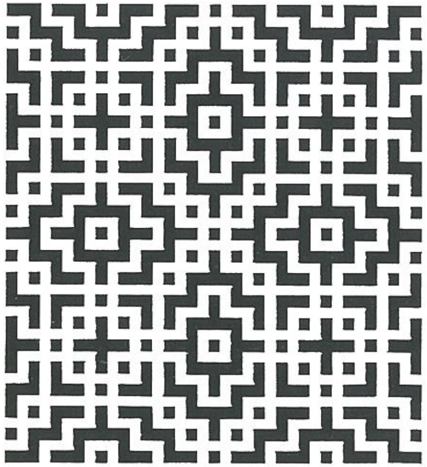
Below on the left is a design from the Tarik Khana Minaret at Damghan. On the right is a pattern from a tomb in Isfahan. It strongly resembles the brickwork patterns but is in fact made from square tiles.

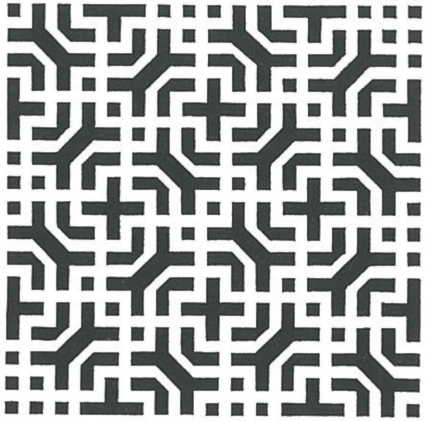


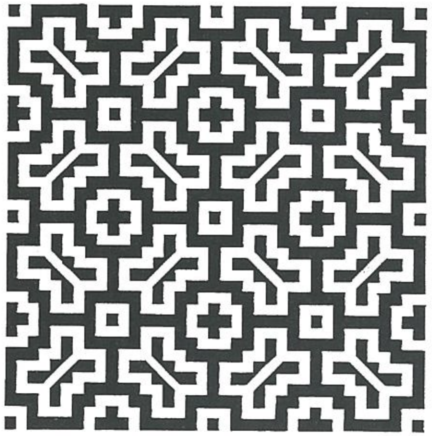


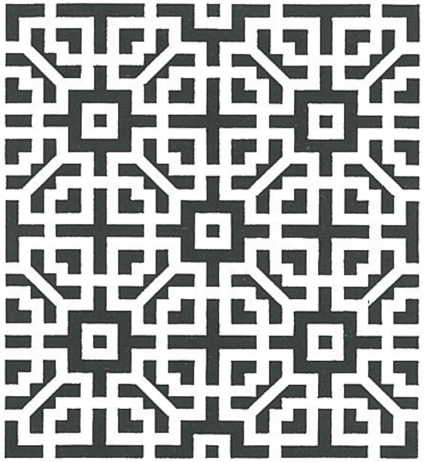
The upper pair of designs come from the Ribat-i Sharaf Caravanserai.

Below right, the pattern is from the Jami' Mosque at Simnan and below left from the Shrine of Bayazid Minaret at Bistam.

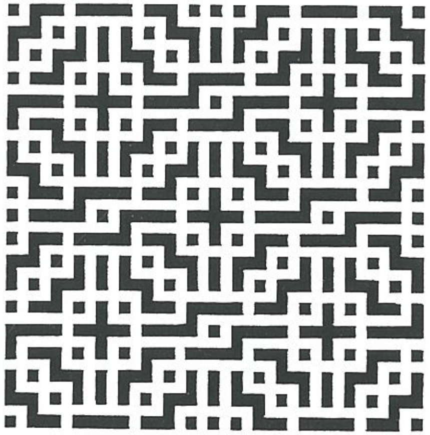


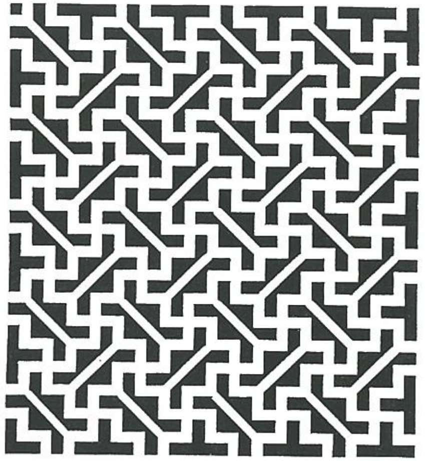


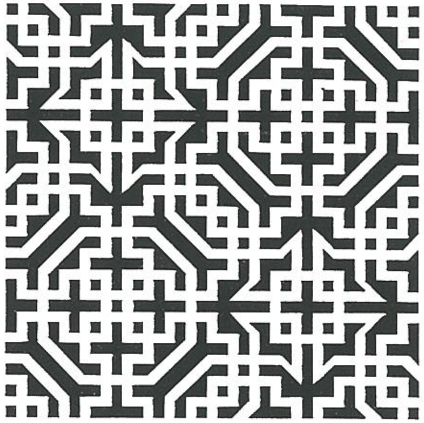


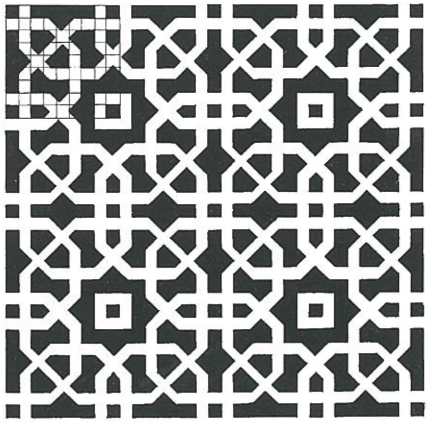


Brickwork patterns are often used in the construction of minarets and all four of these patterns come from minarets. They are at Simnan, Sava and Damghan.

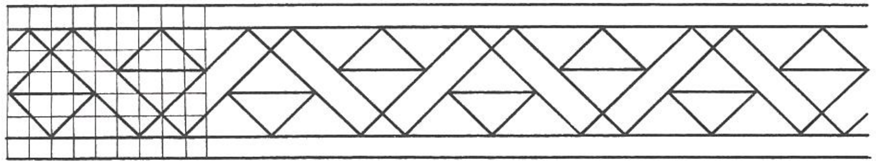




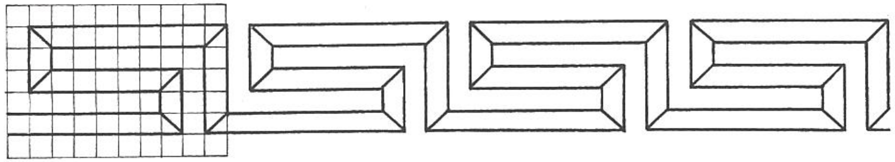




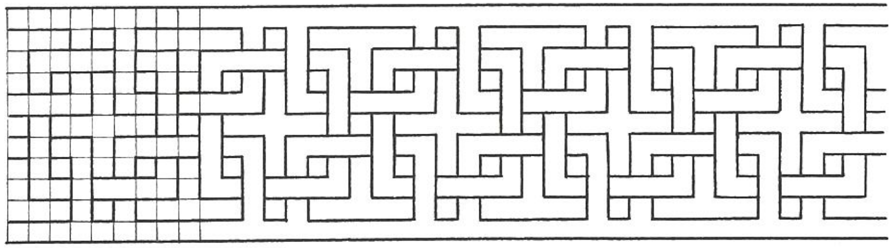
Border patterns are an important feature of Islamic art and architecture.



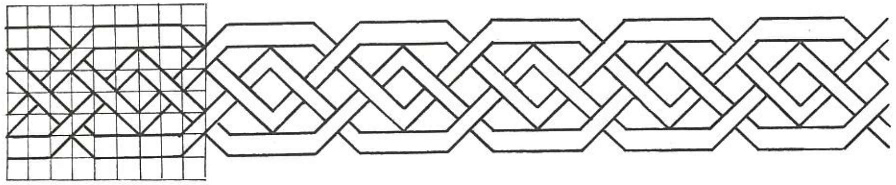
Stucco design from the Pir-i Bakran Mausoleum at Linjan in Iran.



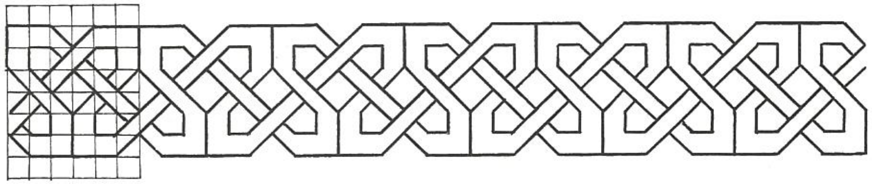
Tiling from the Jami' Mosque at Ardistan in Iran.



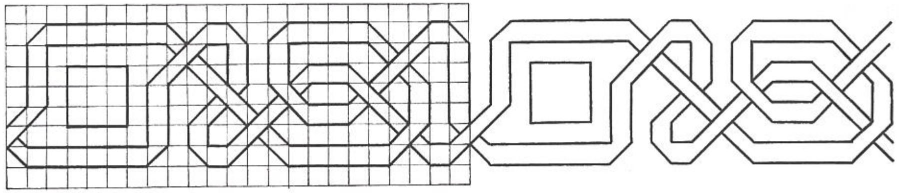
Stucco pattern from the Ribat-i Sharaf Caravanserai in Iran.



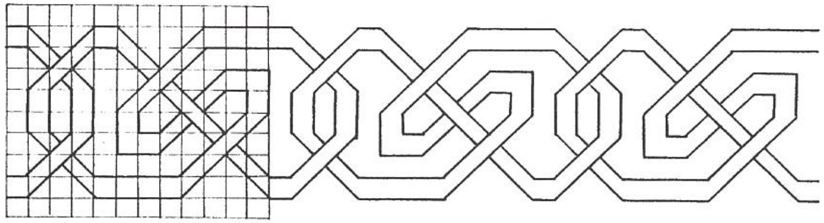
Tiling from the Alcazar in Seville.



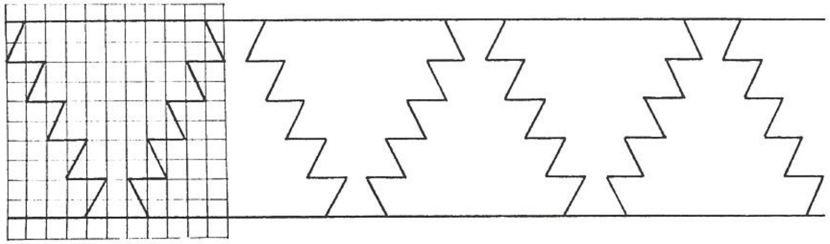
A stucco pattern from the Alhambra Palace in Granada.



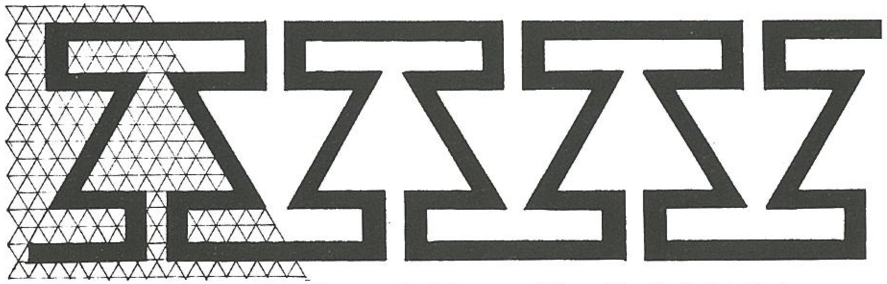
Edge of frontispiece of an illuminated manuscript from a Qu'ran (Koran) housed at the Cairo National Library.



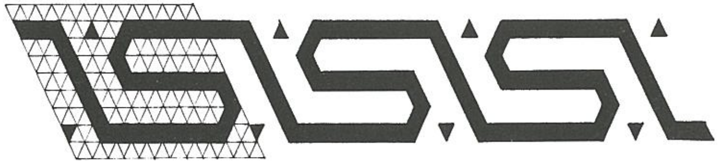
Stucco design from the Alhambra Palace at Granada.



Tiling from the Casa de Pilatos in Seville.



Detail from an inlaid marble frieze at the Mosque of Ilyas Beg in Balat, Turkey.



An example of painted plaster in the cloister of the courtyard of the Blue Mosque in Istanbul.

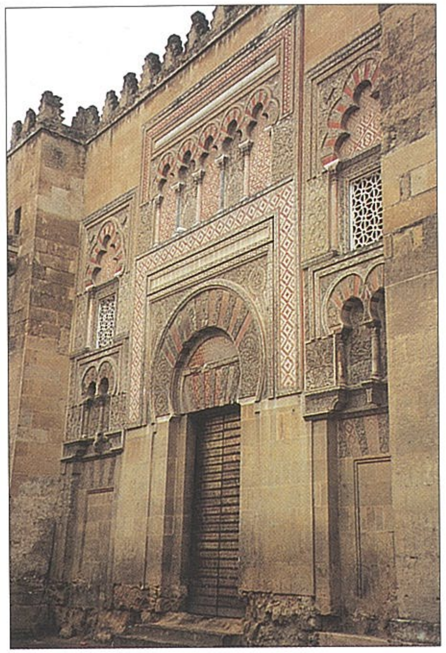
Tile Patterns from Cordoba

The Great Mosque at Cordoba is a wonderful building with an outstanding number of different patterns to be discovered everywhere. Its construction was begun in 785AD and it was added to at various times up to the tenth century. It was built on the site of a church and used columns from the Roman era.

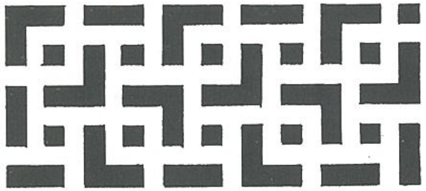
When Ferdinand III conquered the city in 1236, it was reconsecrated for Christian worship. The next major change was in the 16th century; the centre was demolished and a Baroque cathedral built inside.

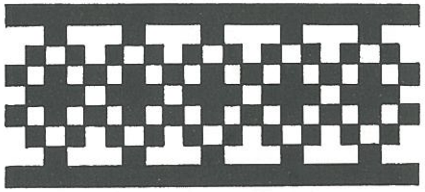
A wall encloses the whole complex and also the Courtyard of the Orange Trees. Highly decorated gateways or doorways provide access through this wall.

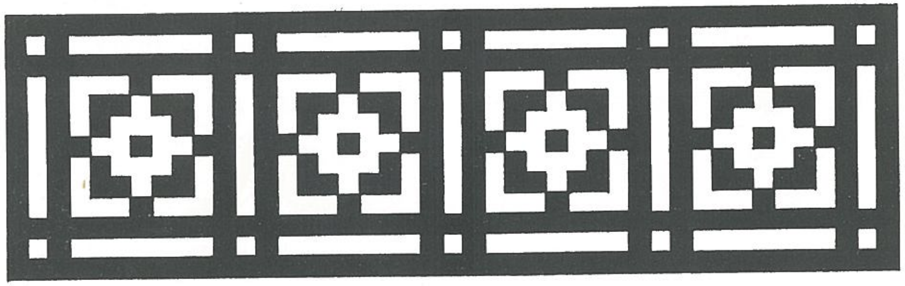
The next four pages are concerned with the red and white tile patterns which decorate these doorways.



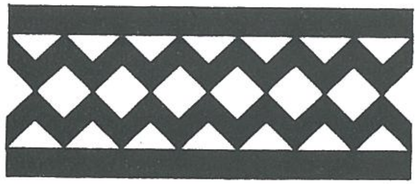
The Great Mosque, Cordoba

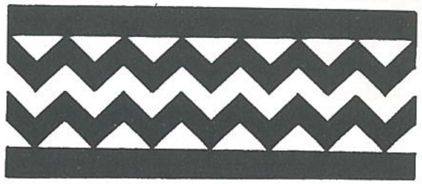


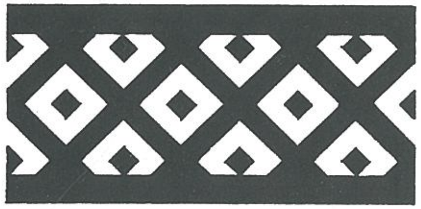


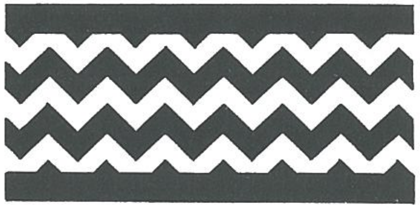


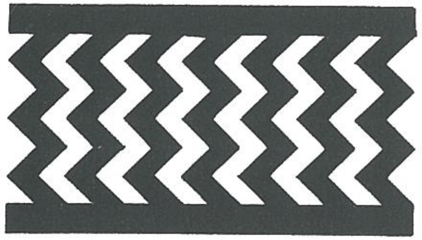
The squares of the underlying grid are arranged diagonally for these patterns.

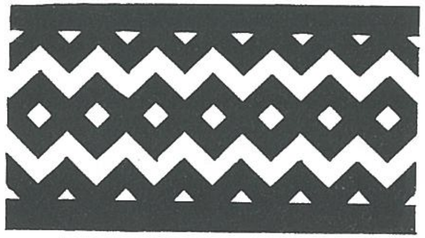


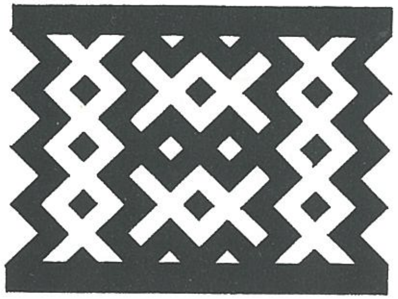


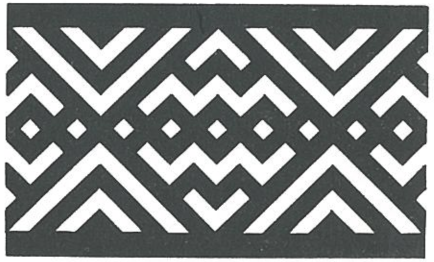


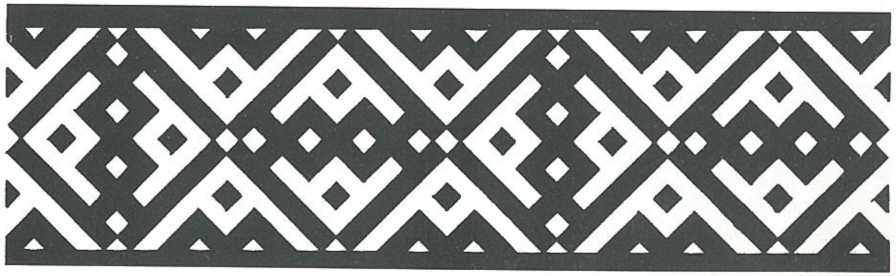


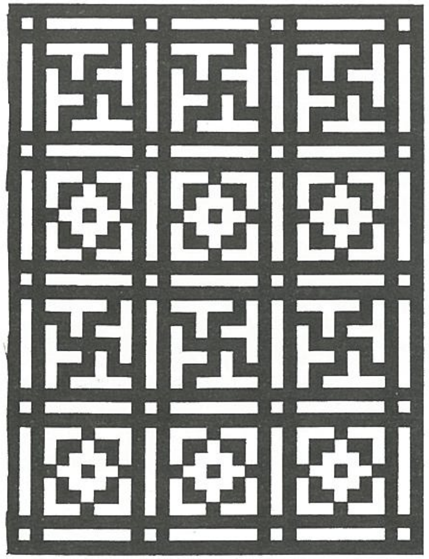


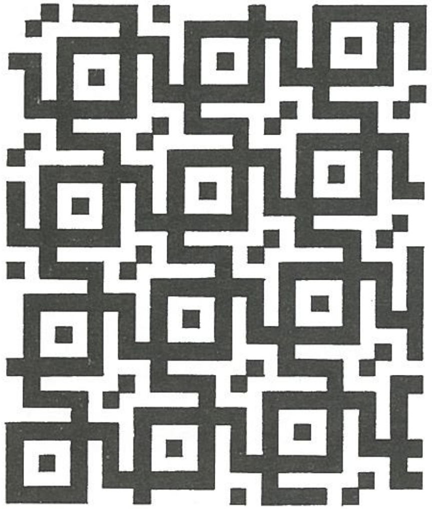


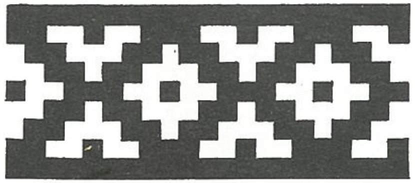


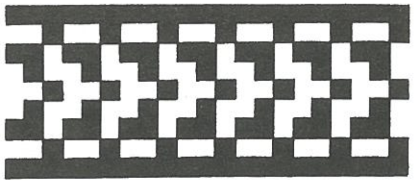


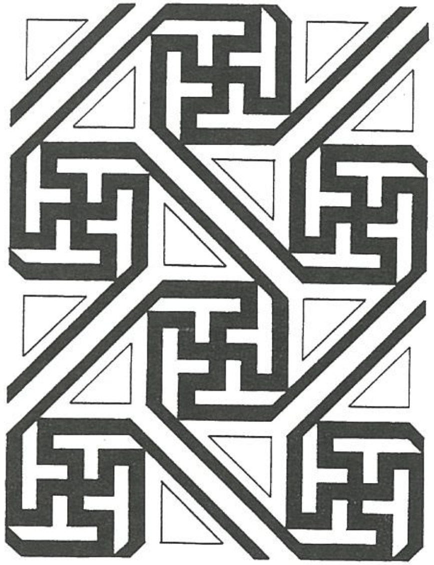


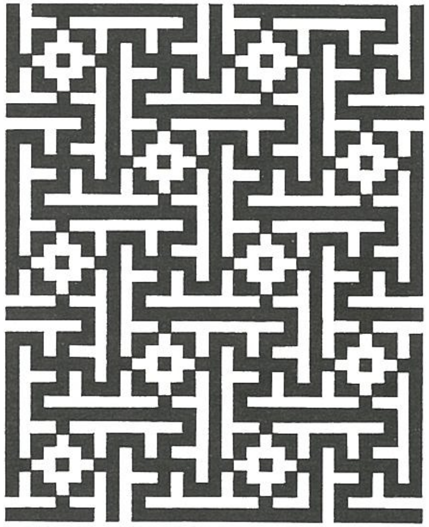


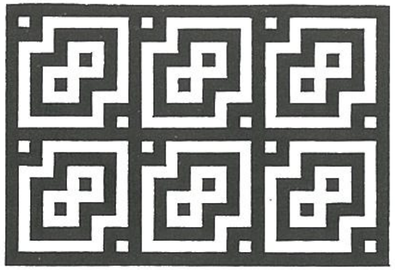


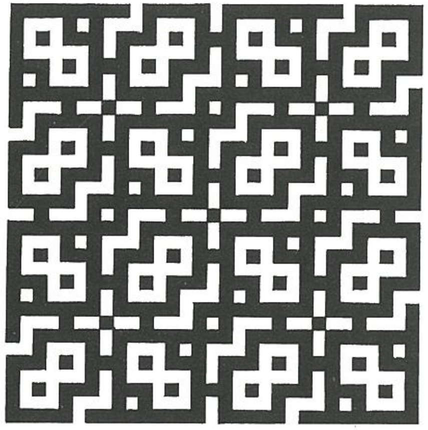


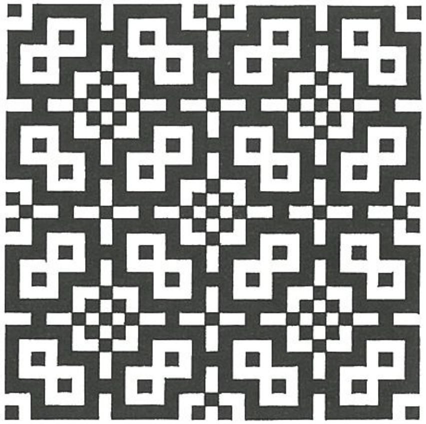


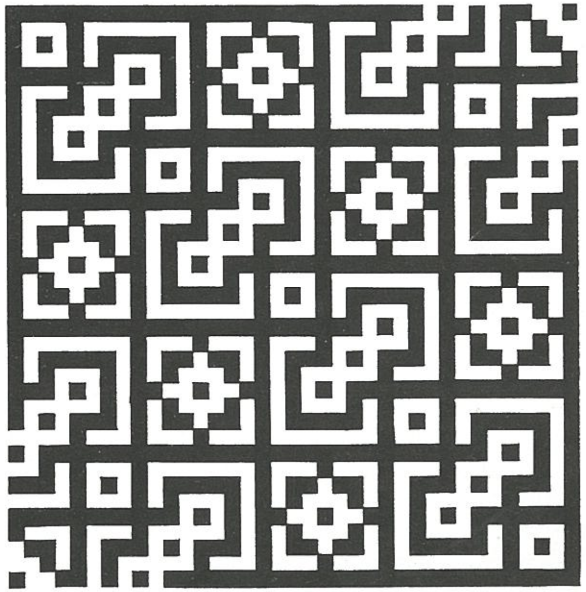




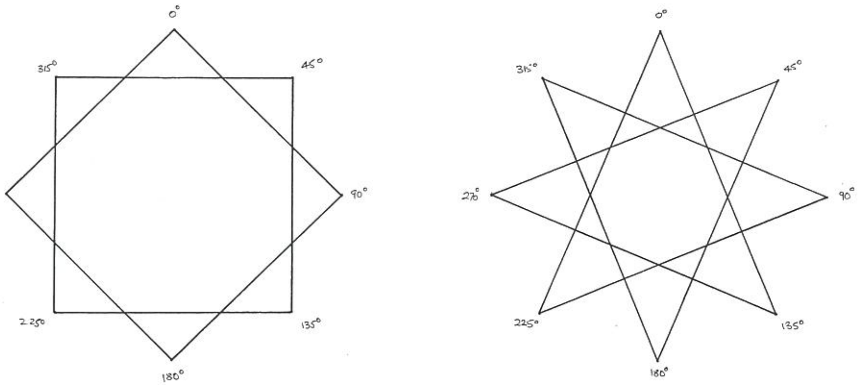




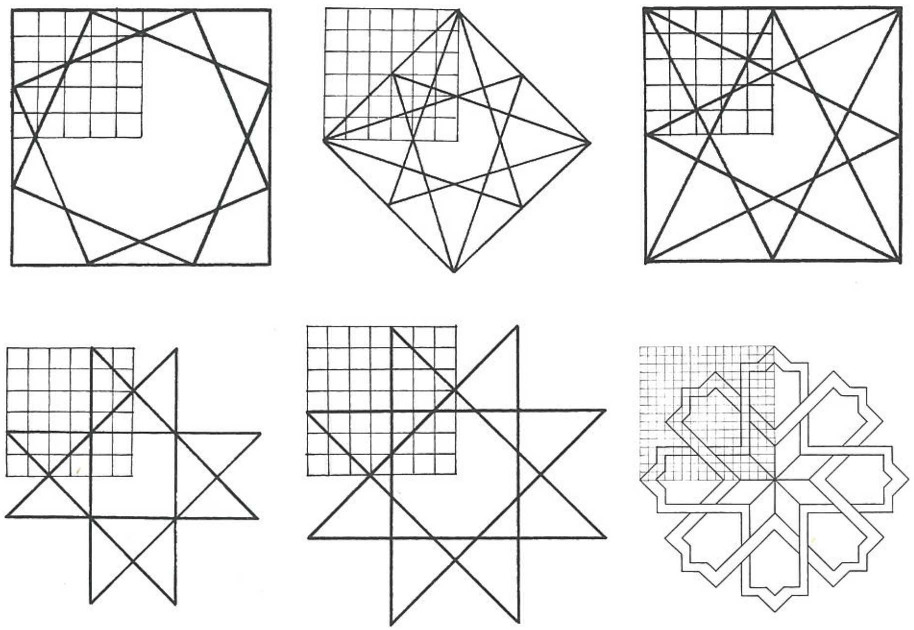




Eight-pointed stars are a very common element of Islamic patterns and there are many different shapes which can be constructed, either with geometric instruments or from a square grid . The next pages show different methods of constructing them and then how they can be developed to give ever more complex patterns.

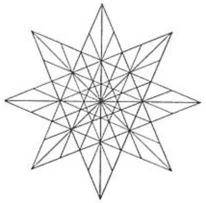


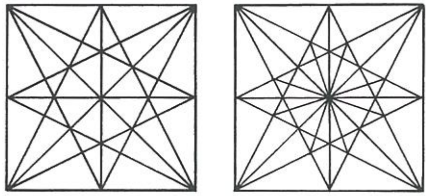
These diagrams show two methods of constucting eight-pointed stars using a circular protractor and by joining the points in different ways. The first, by joining every other point, the second by missing two points and joining the first to the fourth etc.

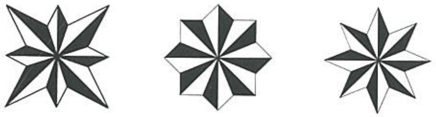


Six different ways of constructing eight-pointed stars using squared paper.

The star patterns can be made more intricate by joining the outer points and the other intersections to one another in a systematic way.

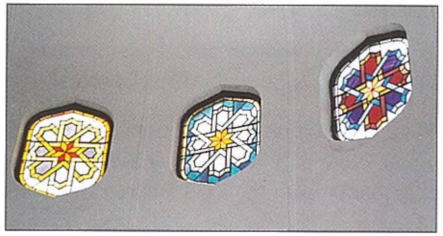






Inlaid wooden box, Tunisia

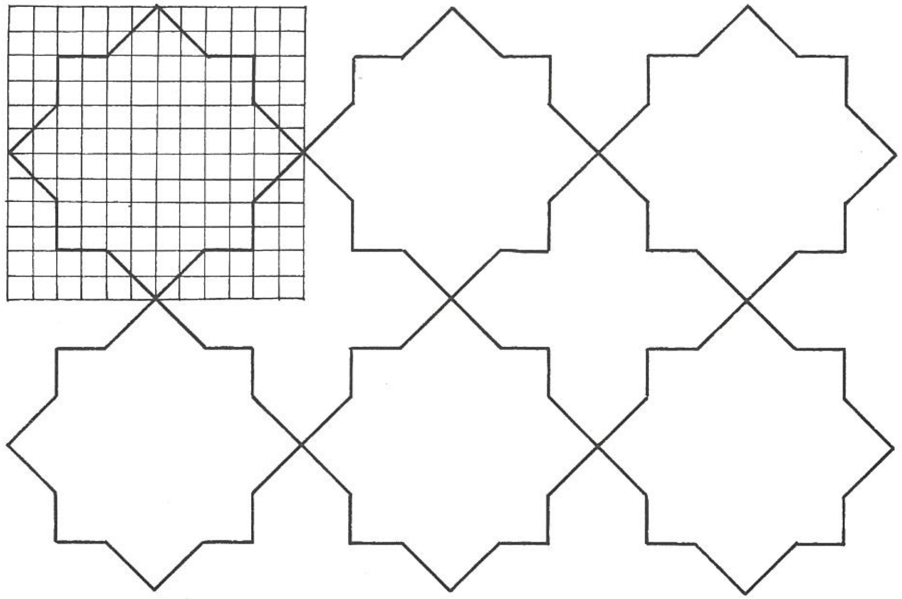
Inlaid wooden box, Syria



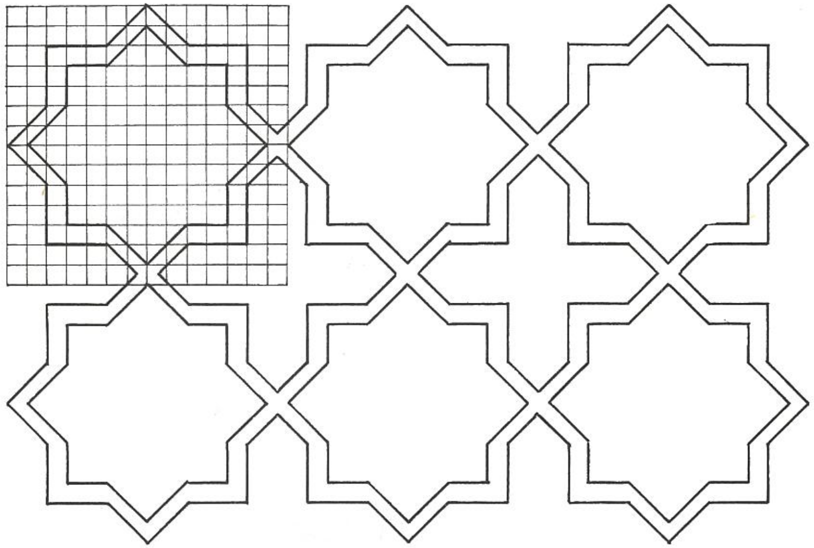
These three stained glass windows with eight-pointed stars are in the dome of the Islamic Centre and Mosque in Butetown, Cardiff. See the bottom right drawing opposite.

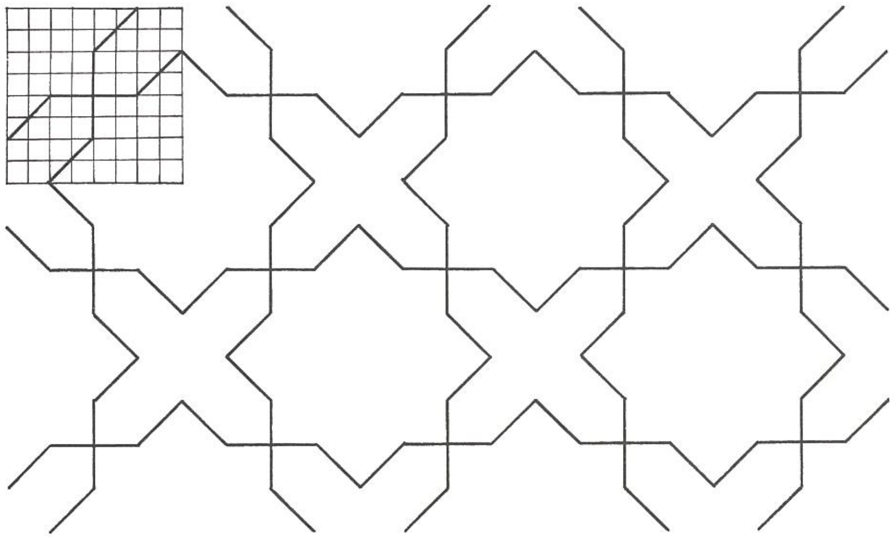
Stucco and tile decorations from the Barber's Mosque, Kairouan, Tunisia.

The simplest of the eight-pointed stars is in fact very rich in possibilities. If they are tiled horizontally and vertically so that they touch point to point, a very interesting cross-shape appears between them. This example is from the Alhambra, Granada.

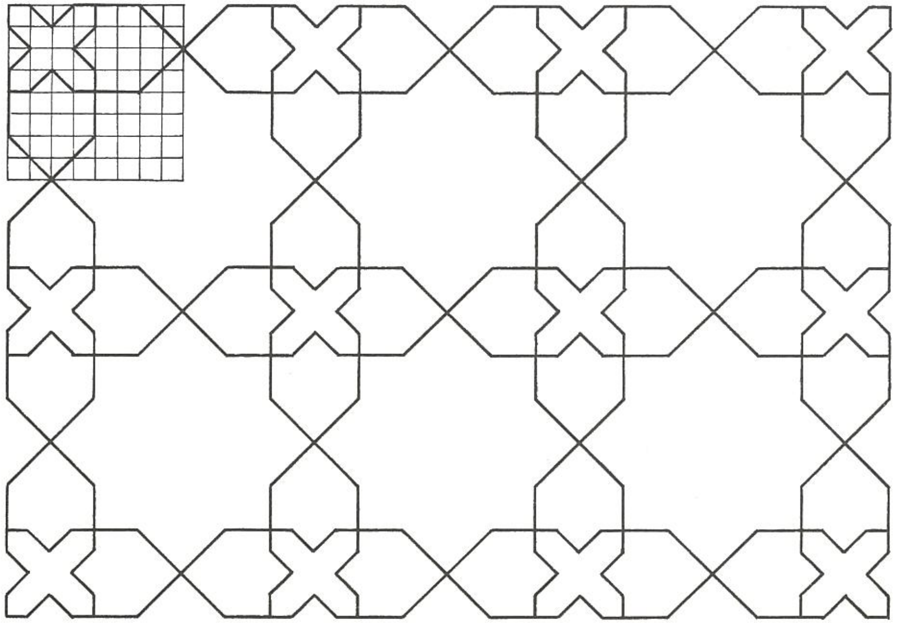


This pattern looks even better if it is developed to generate wide borders between the units. Note how the cross-shape now becomes much more refined and elegant. This example is from the Pir-i Bakran Mausoleum, Linjan, Iran.

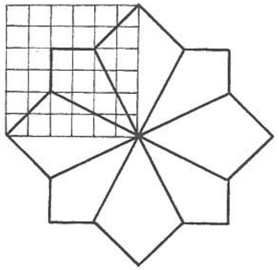


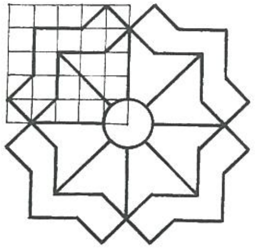


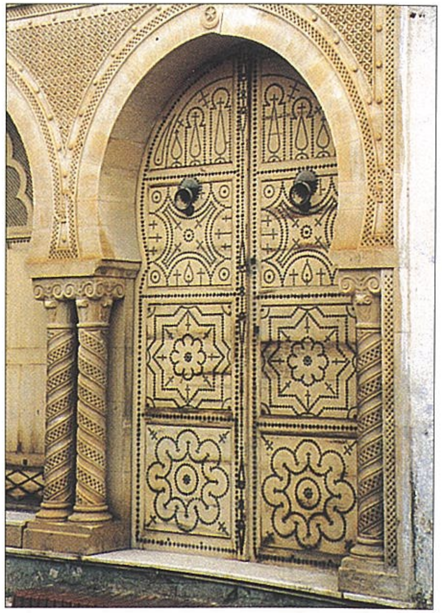
Look for the same eight-pointed star in each of these patterns. The upper variation is from some Persian tiles in the Victoria and Albert Museum in London, while the lower one is from the Seljuk palace at Kay Kubadabad in Turkey.



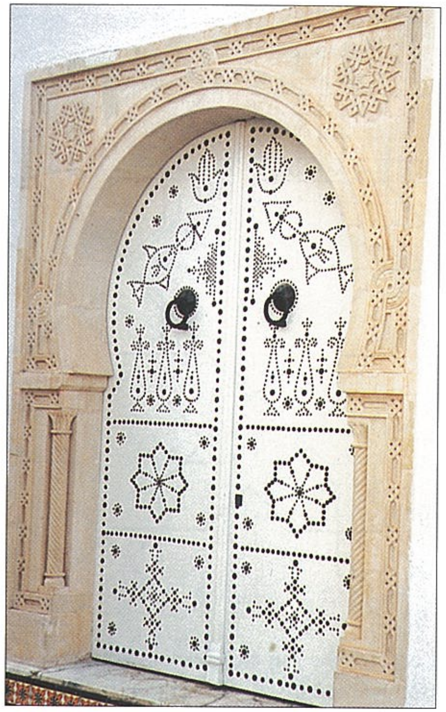
Nail-studded doors are very popular in Tunisia. The top one has fish-like and plant-like designs as well as an eight-pointed star design, based on a square grid.





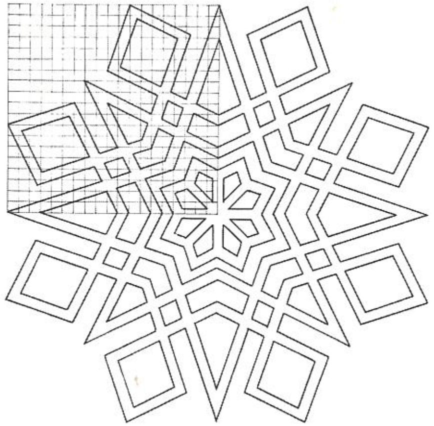


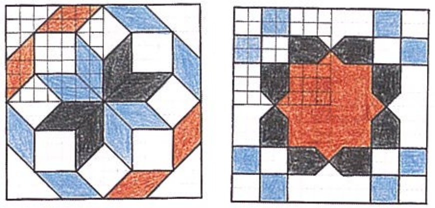
Kairouan, Tunisia



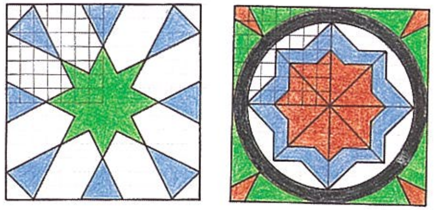
Hammamet, Tunisia

Notice also above the door arch, the pair of more elaborate eight-pointed stars carved into the stonework.

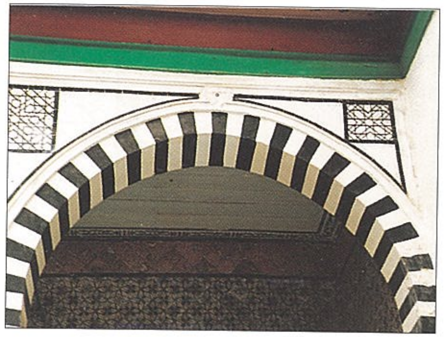




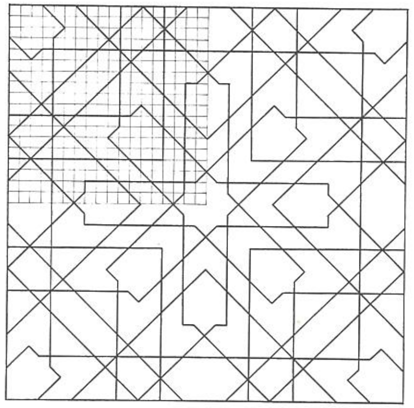
Coloured tile designs with eight-pointed stars from the Tile Museum in Lisbon.

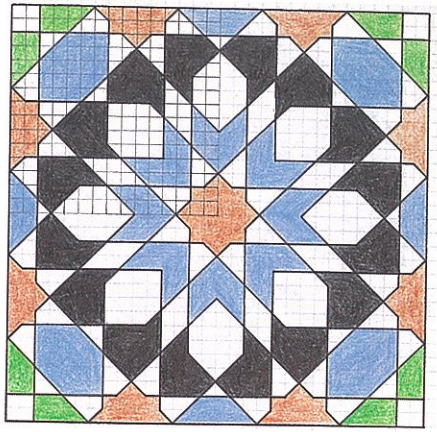


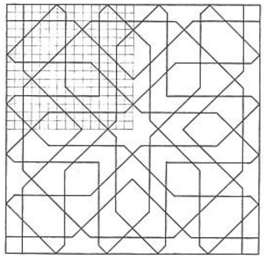
Below are black and white patterns on an archway in the Bardo.



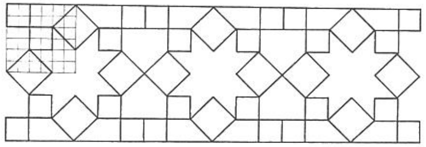
The Bardo, Tunis

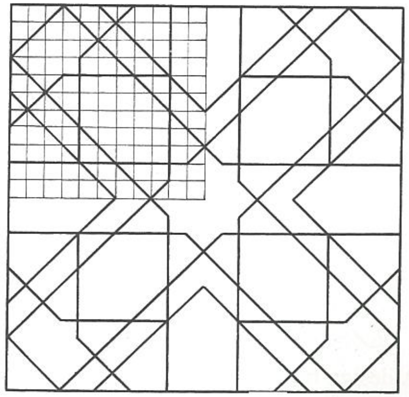


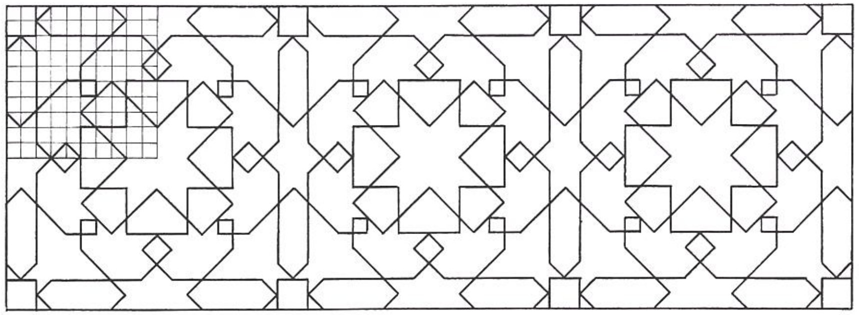




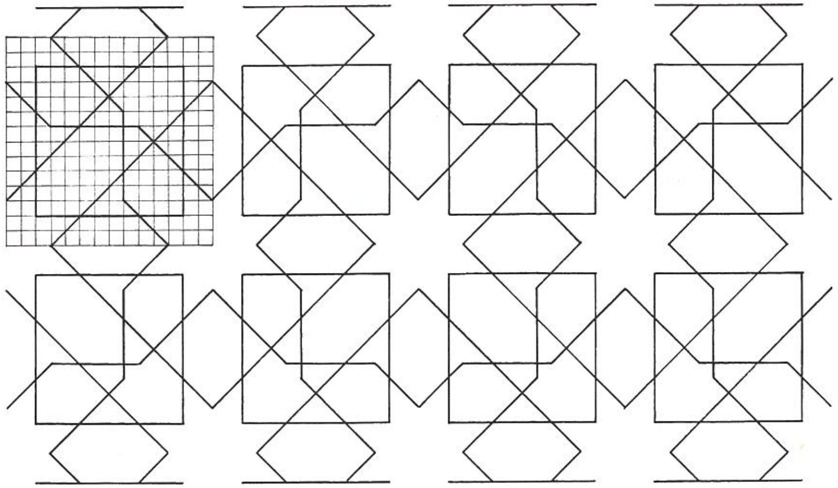
The tile border design below comes from the Great Mosque at Cordoba.



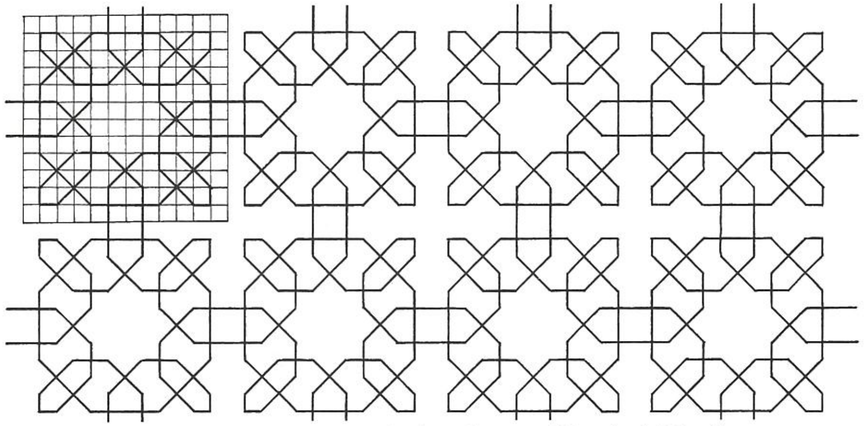




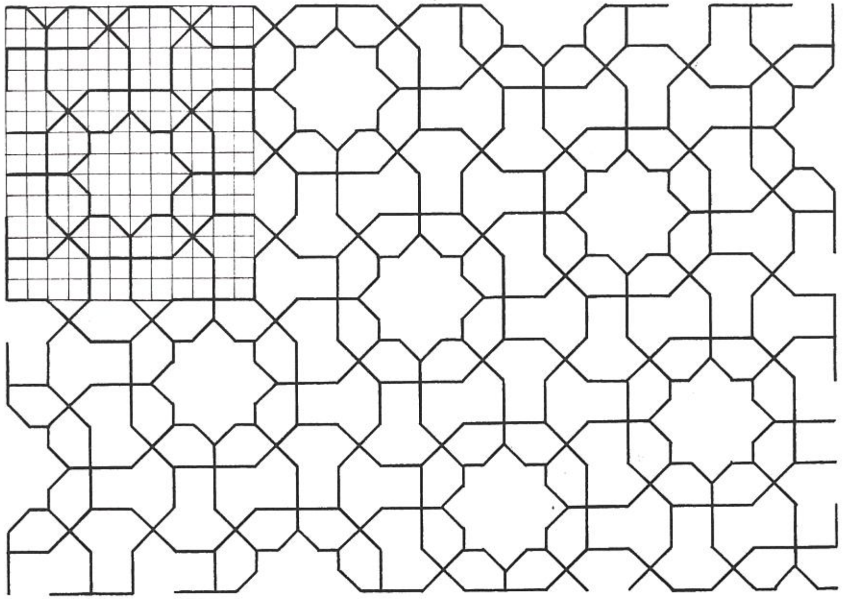
A tiling pattern from the Alcazar in Seville.



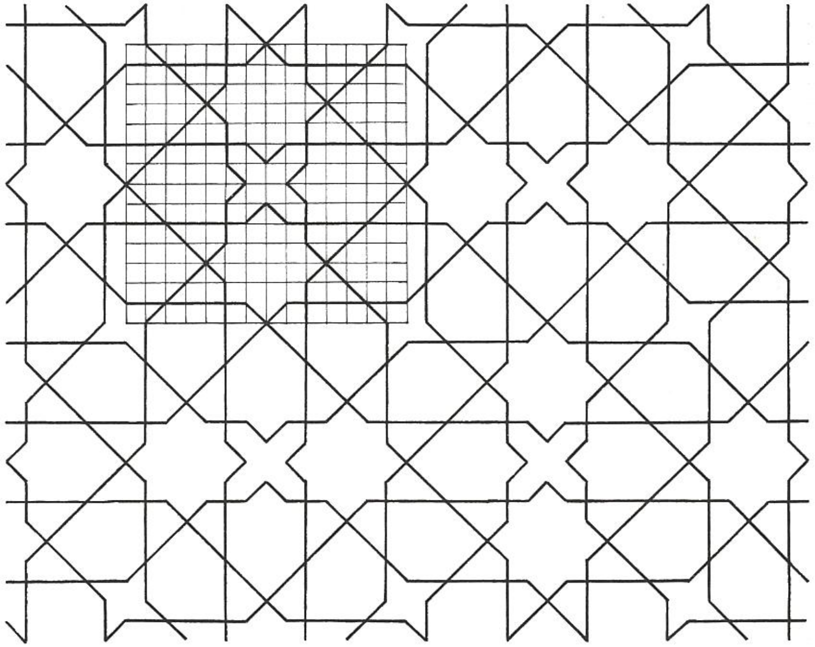
A design from the Bedi Palace in Marrakesh, Morocco.



A design from brickwork decoration in the Minaret of Jam in Afghanistan.

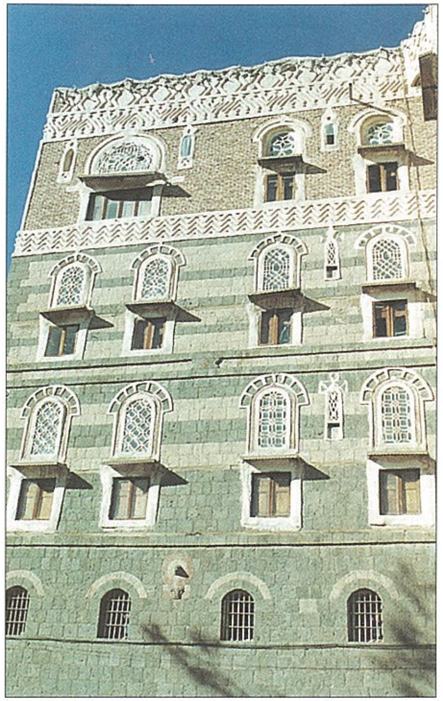


A pierced marble screen pattern from the tomb of Shaykh Salim Chisti near Agra in India.

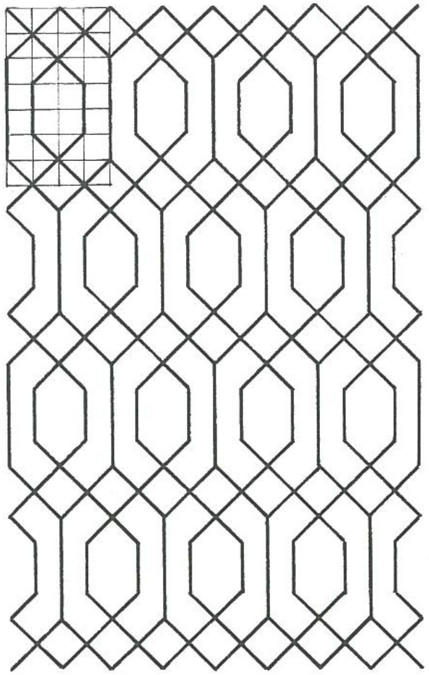


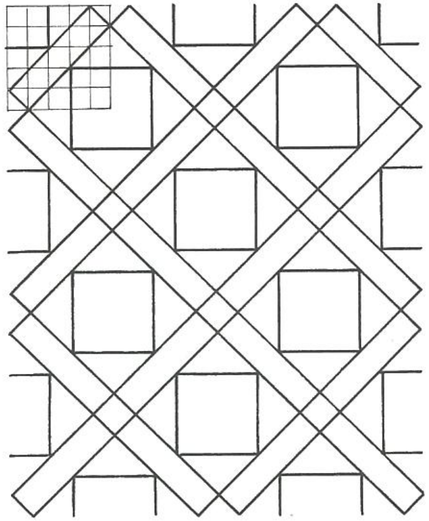
A Moorish tiling pattern from the Alhambra in Granada.

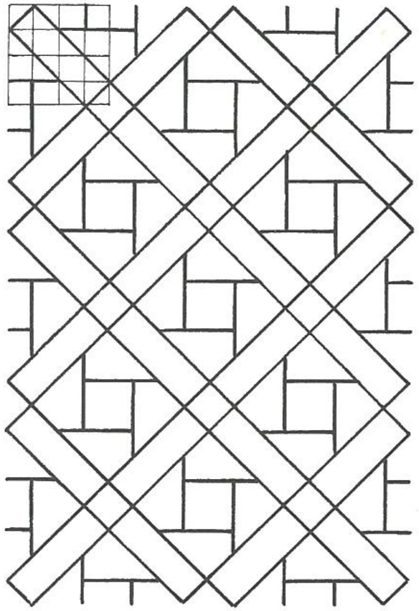
The next four pages are devoted to a collection of patterns of glazing bars from windows in Yemen. They are remarkably elaborate and inventive.

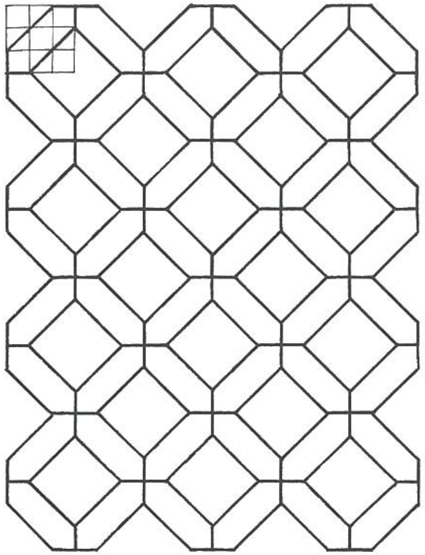


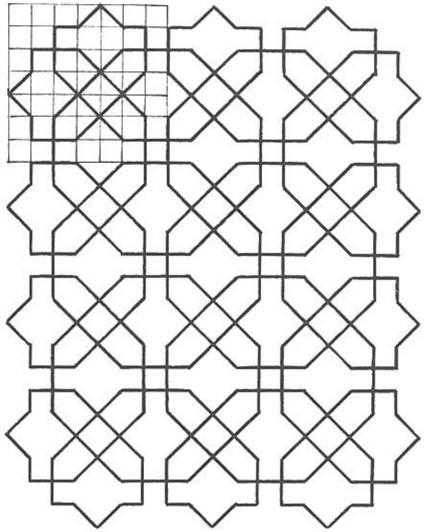
Sana'a, Yemen

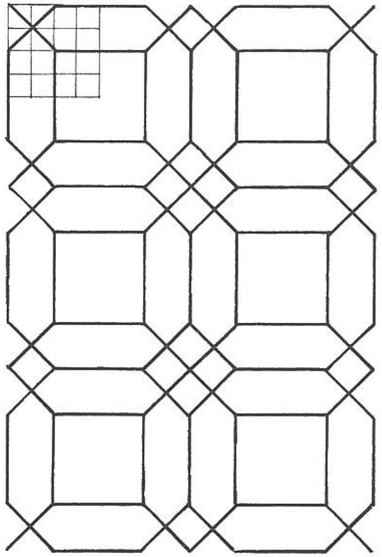


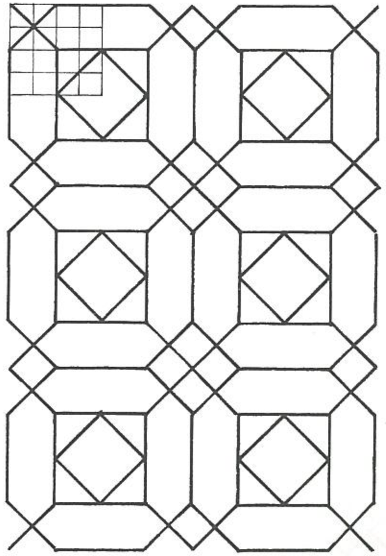


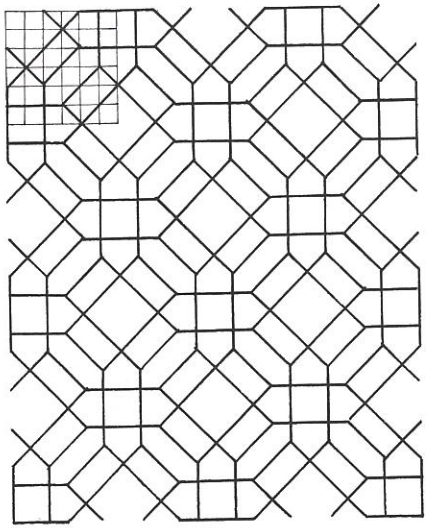


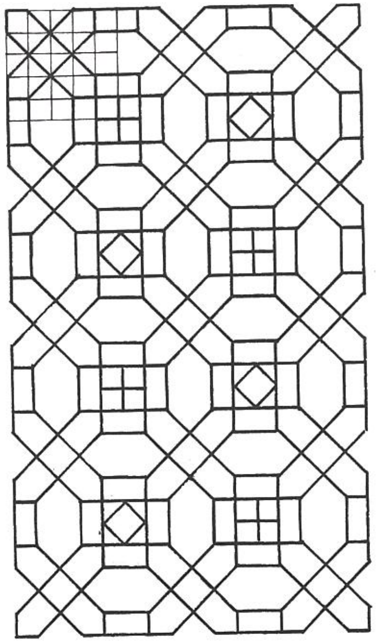


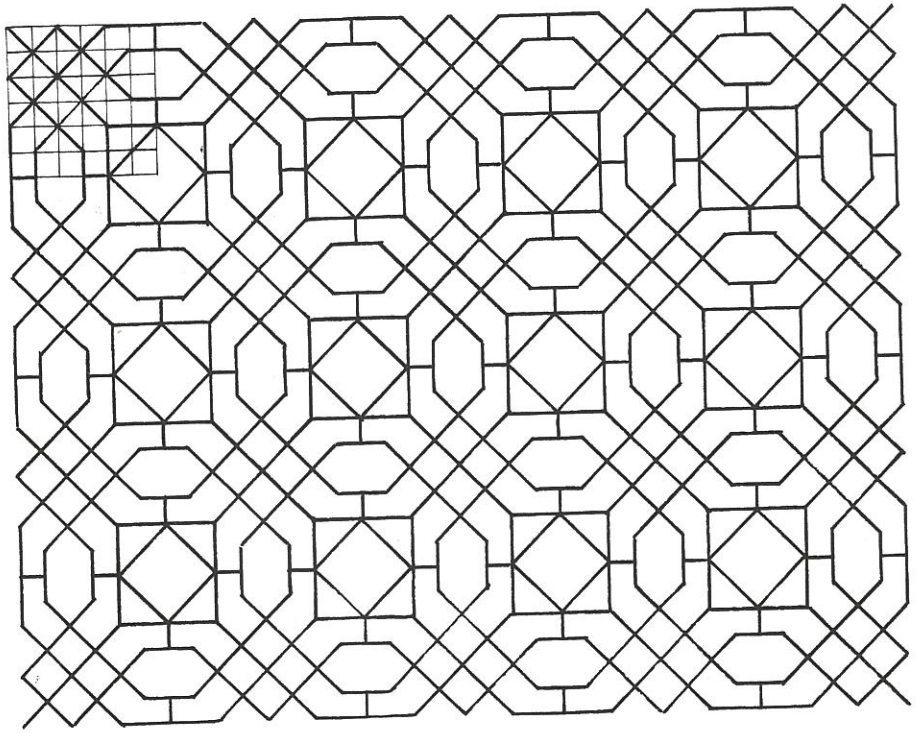


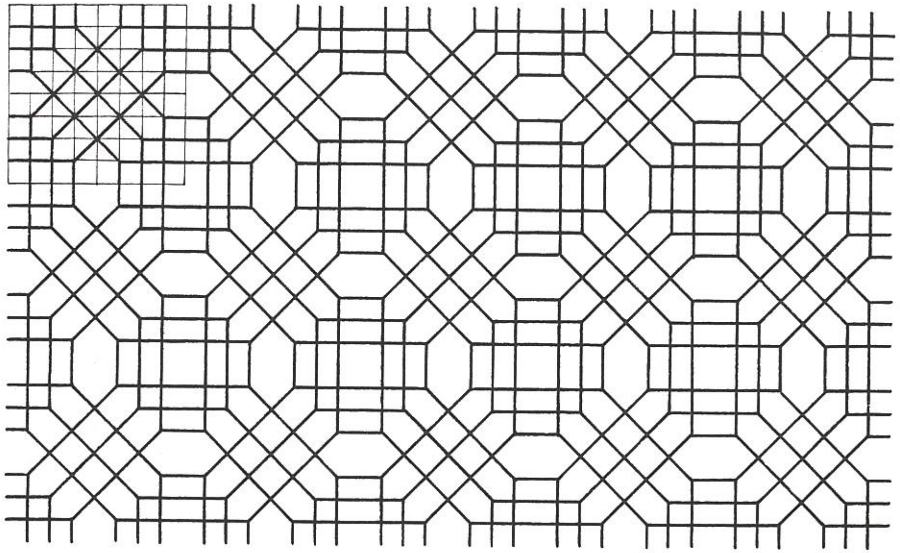


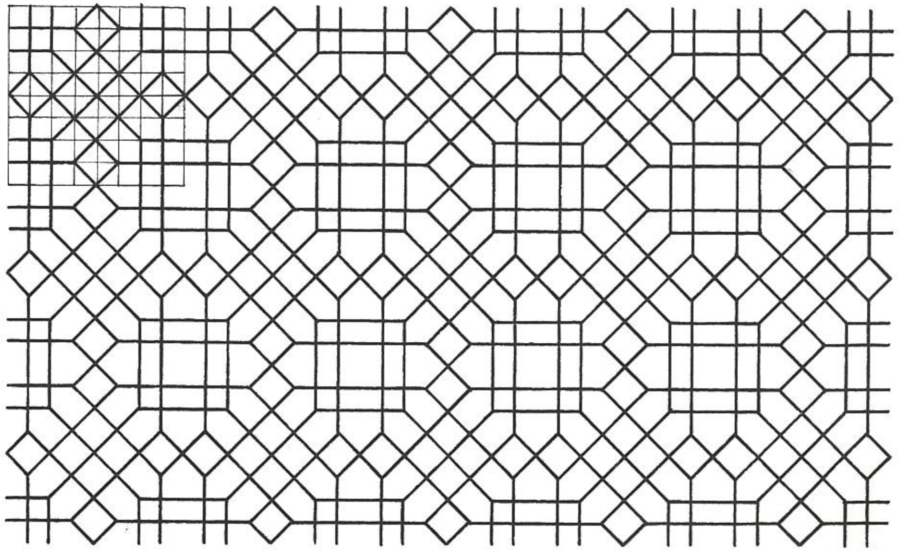




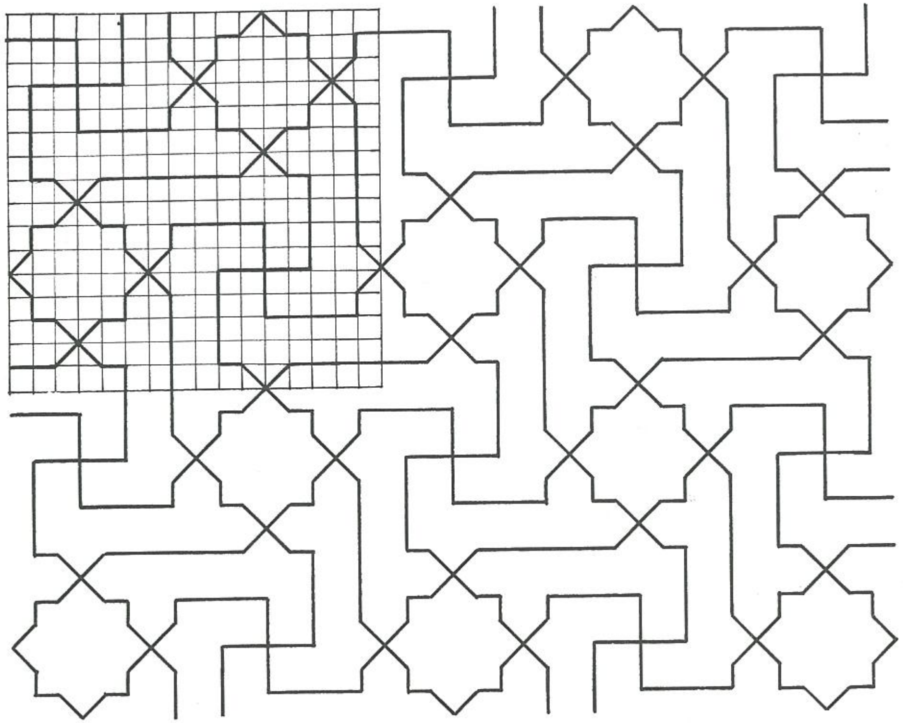




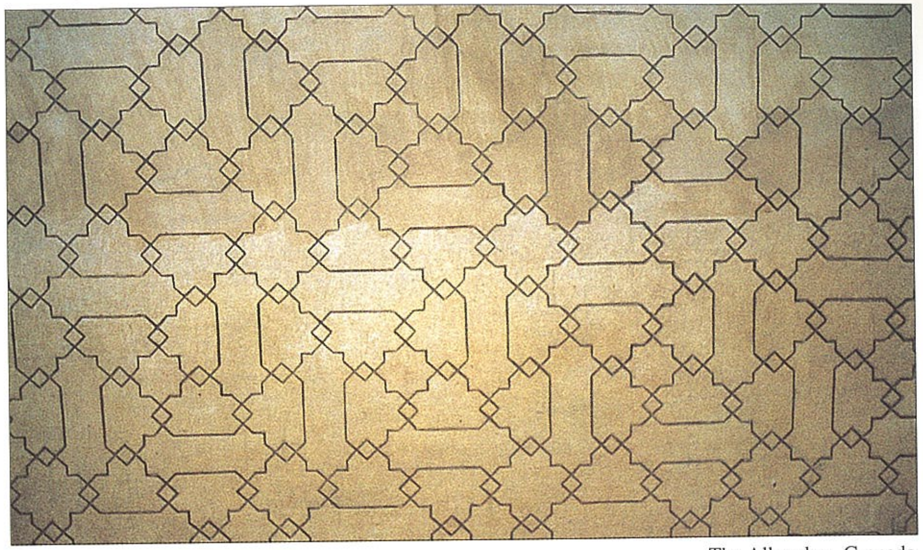




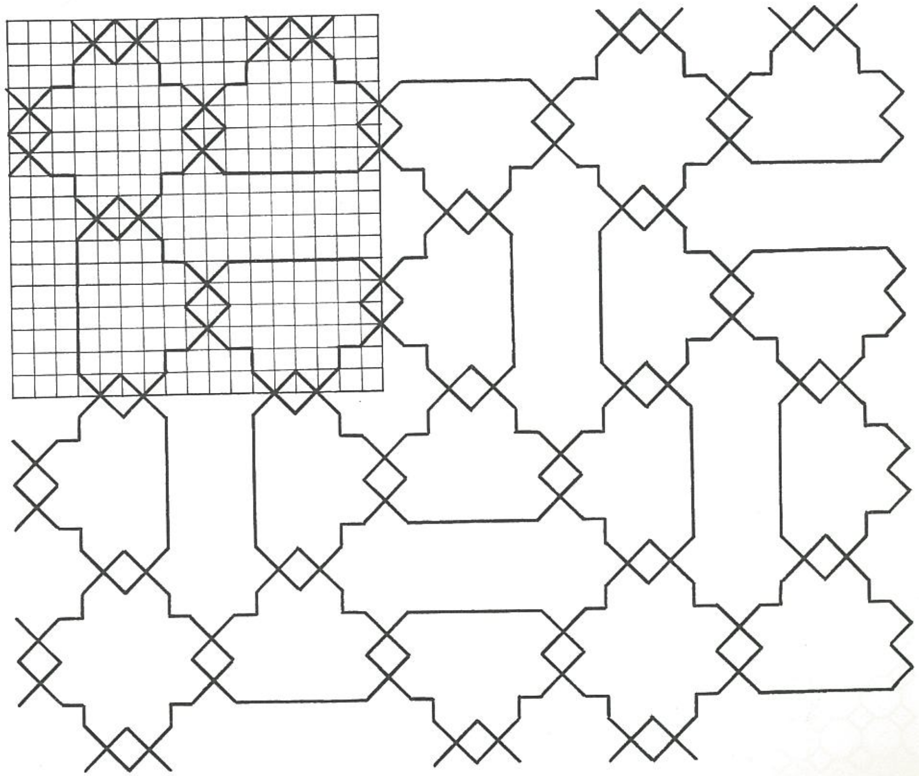
The Alhambra Palace has an astonishing range of repeating patterns in the tilework and stucco decoration which cover its walls. Both of these patterns come from the Lion Courtyard and both are ingenious developments of squares set obliquely upon a square grid. Look carefully at the way they are achieved.



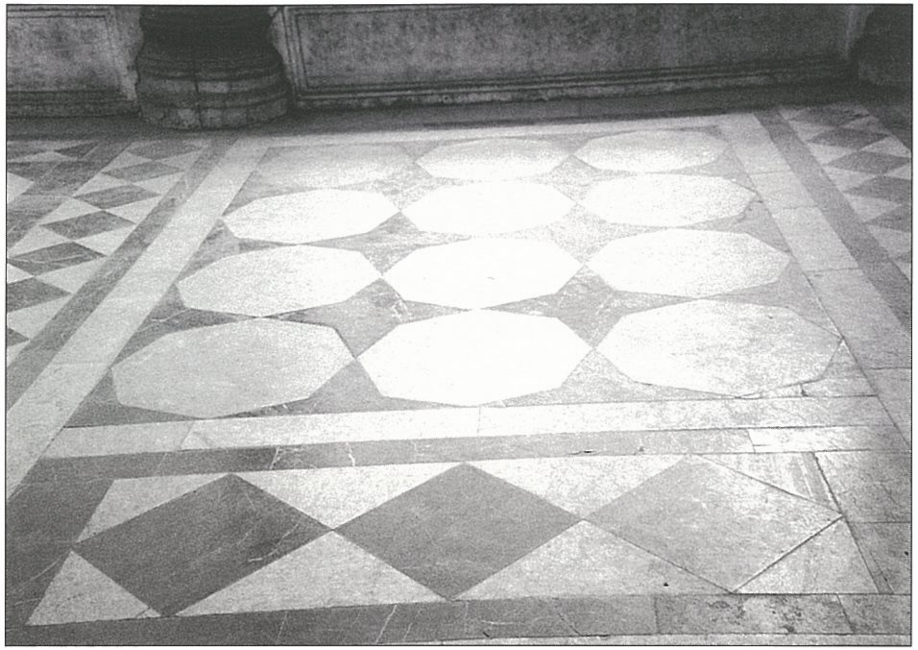
The Alhambra, Granada



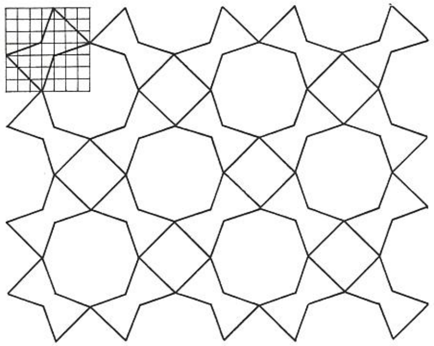
The Alhambra, Granada

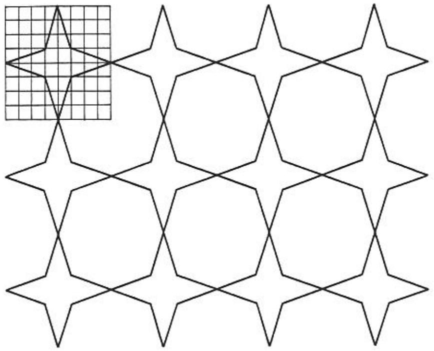


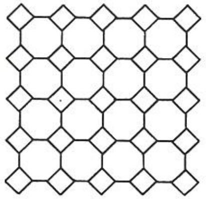
Octagons of various shapes appear widely in Islamic patterns. The next four pages show patterns that have octagons as the main element of the design. They are commonly found in marble floors and as tiling patterns.

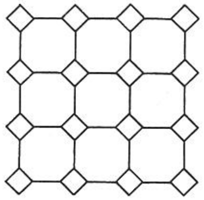


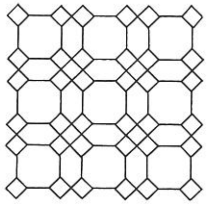
Topkapi Palace, Istanbul

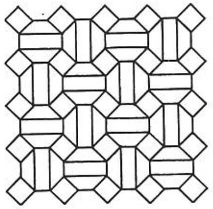


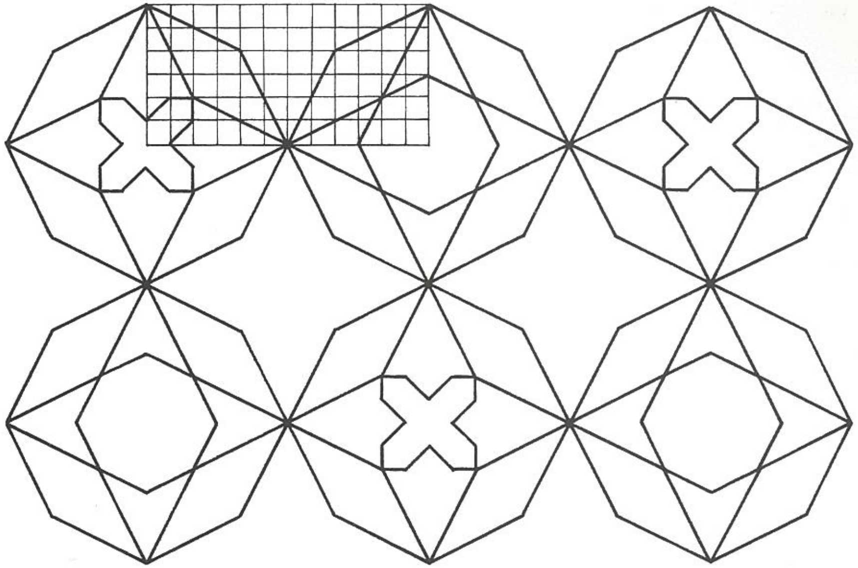


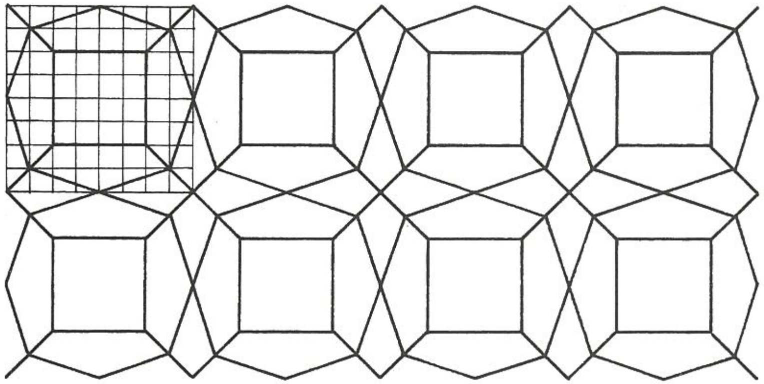


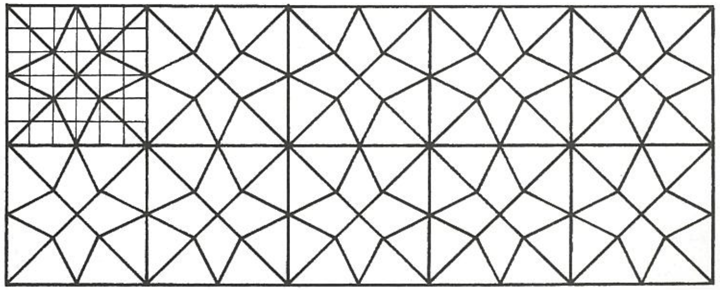


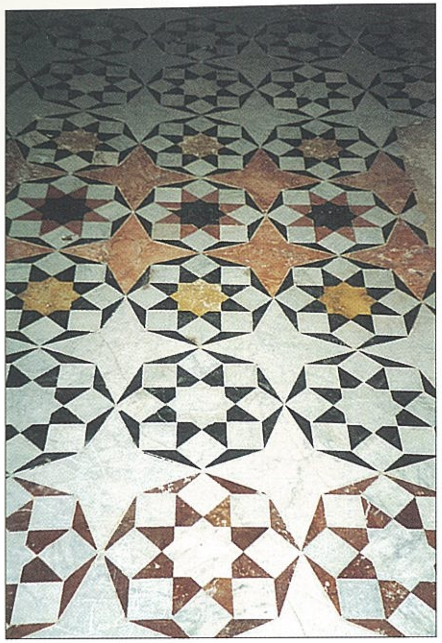




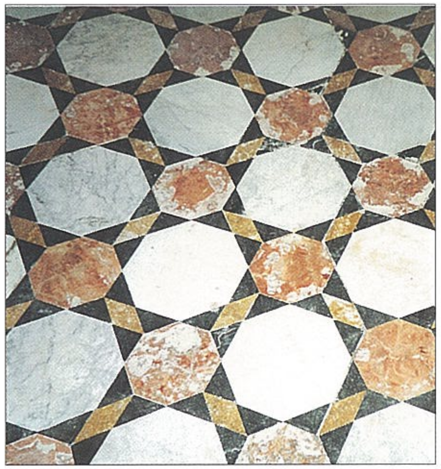






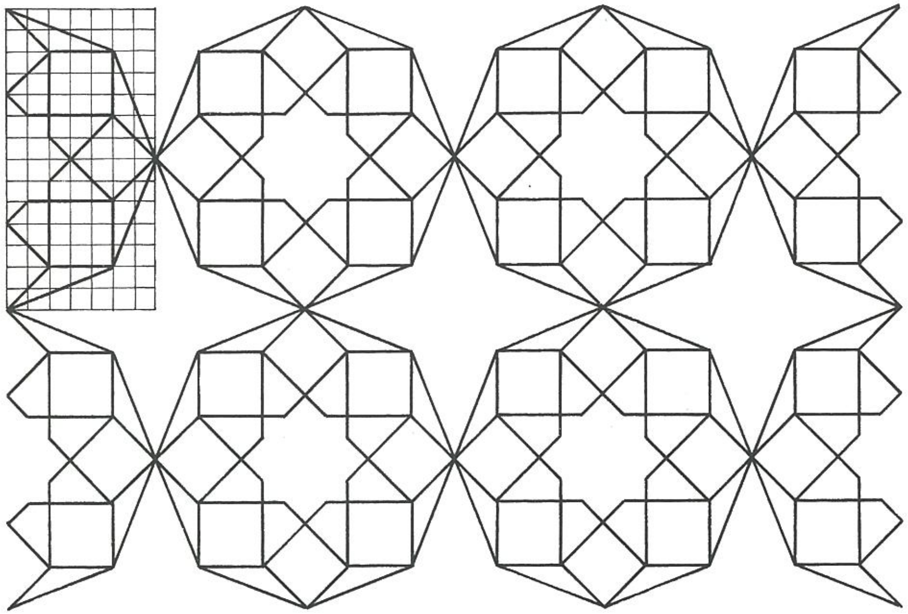


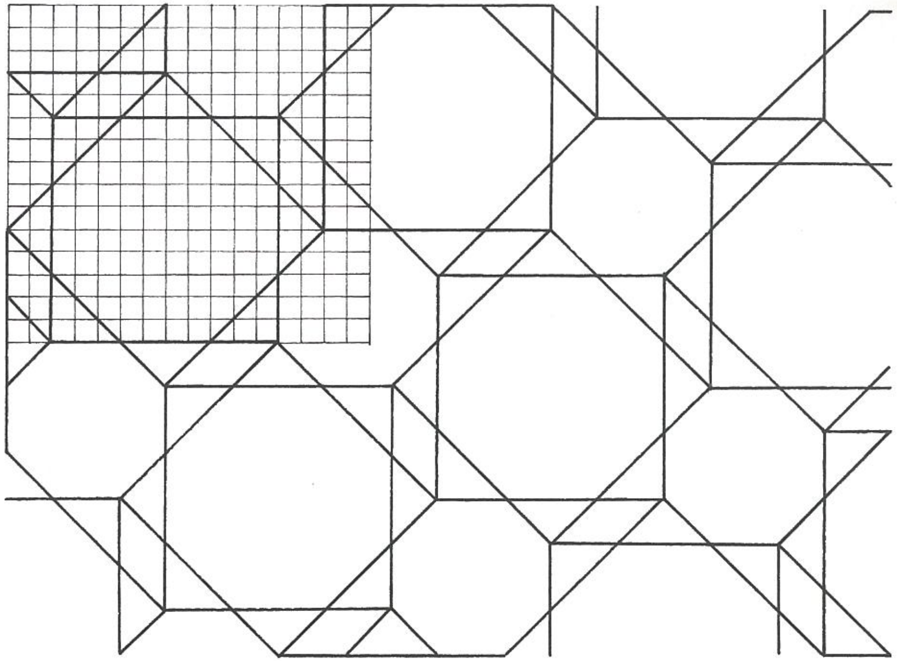
Citadel, Aleppo



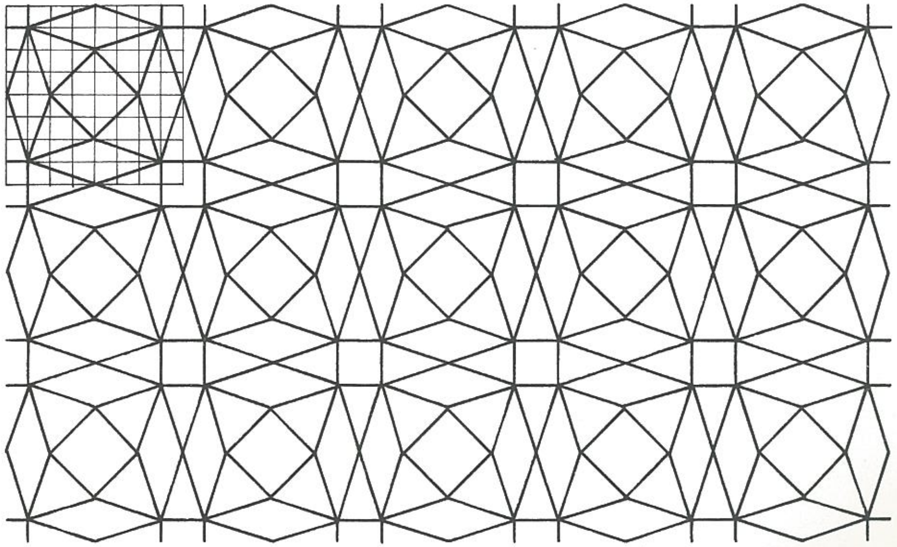
Citadel, Aleppo

Inside the Citadel at Aleppo in Syria are some impressive marble *opus sectile* floors which explore the relationships between octagons, squares and eight-pointed stars.



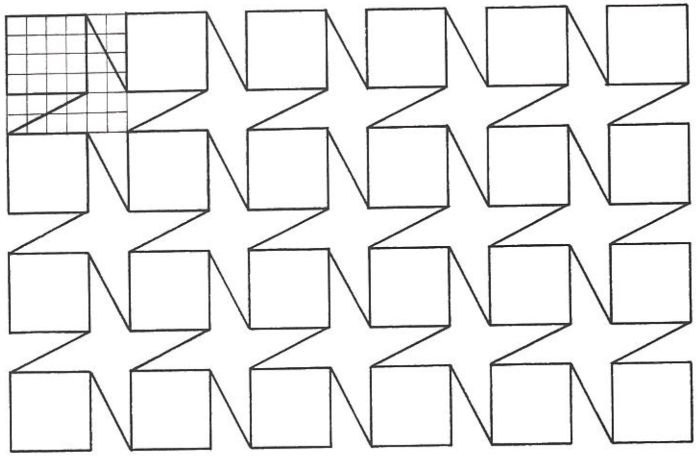


This pattern also comes from the Citadel at Aleppo and shows yet another way in which octagons and eight-pointed stars can be combined.

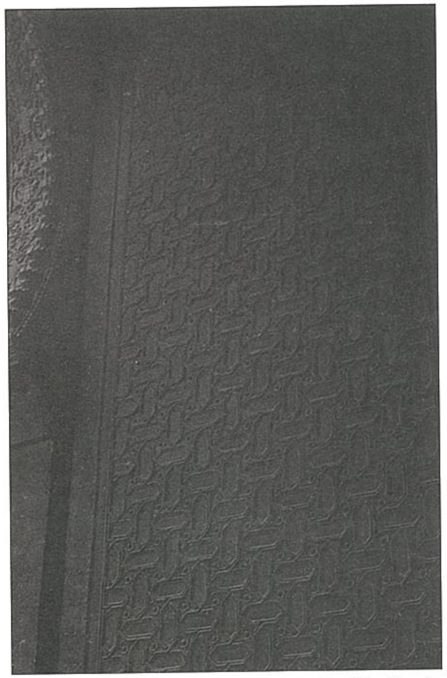


In this pattern from Sirçali Madrassa at Konya in Turkey, the rows of octagons generate overlapping sixteen-sided polygons with squares at their centres.

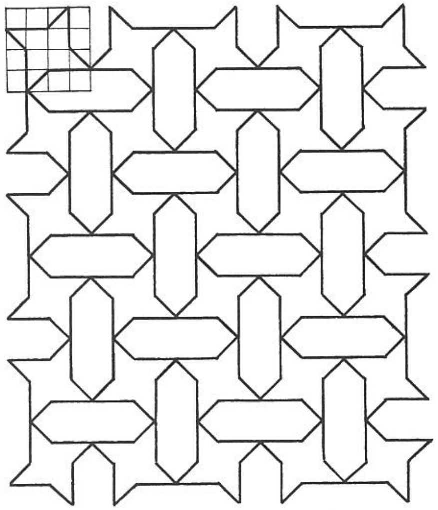
The patterns on the next six pages form a collection of unusual shapes which are difficult to classify under a particular heading but which tessellate beautifully and often unexpectedly. For instance, both patterns on this page include a similar four-pointed star but are developed quite differently. One is from Turkey, the other from Spain.



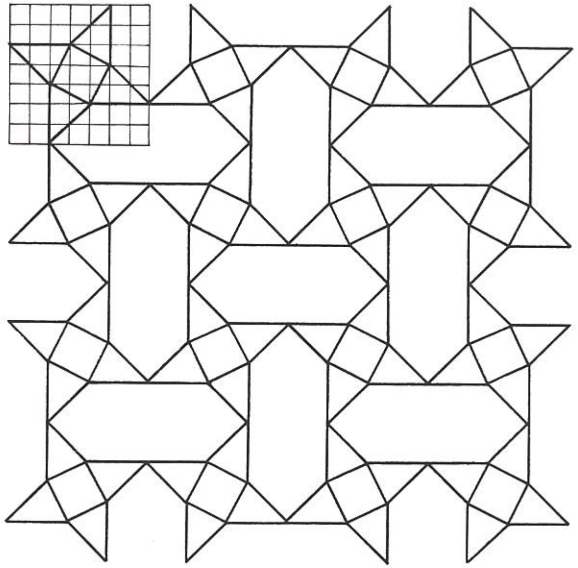
The design above is taken from a minature painting in the Topkapi Palace in Istanbul.



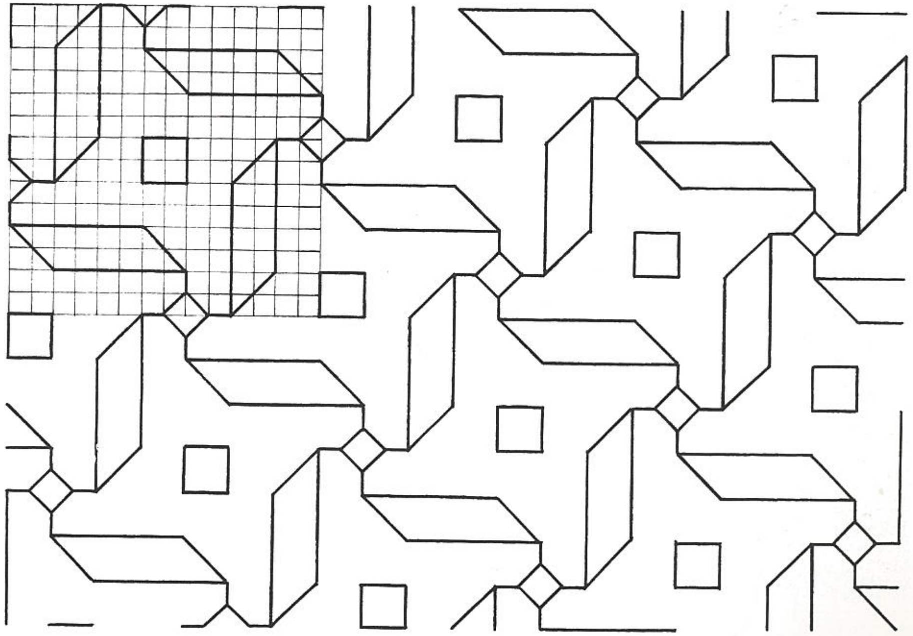
Seville, Spain



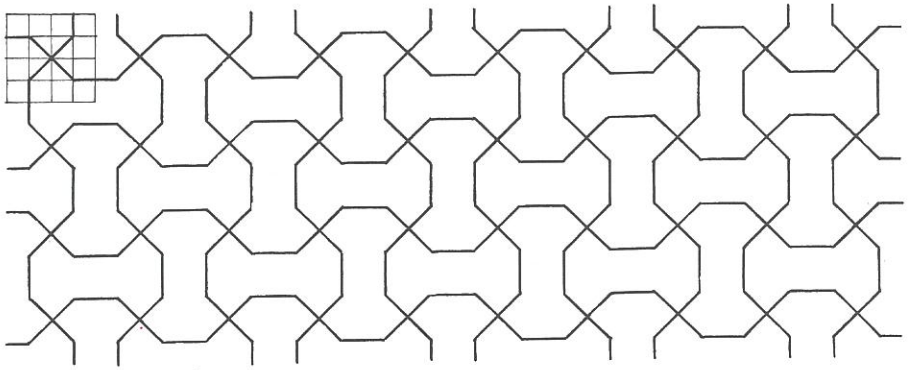
This design is taken from a massive bronze door in the Cathedral at Seville.



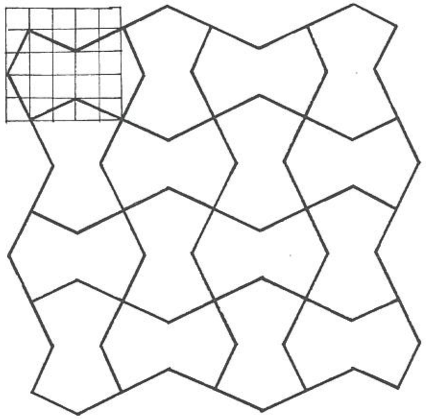
Both the designs on this page are from Istanbul. The one above is from a marble *opus sectile* floor at the Topkapi Palace and the one below from tiles at the Mosque of Rustem Pasha.



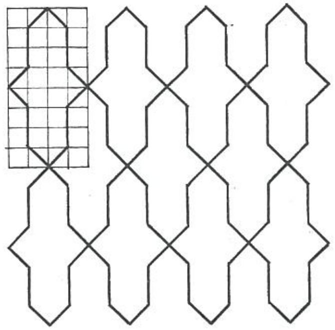
The patterns on these two pages are each generated from a single shape, arranged in different ways.



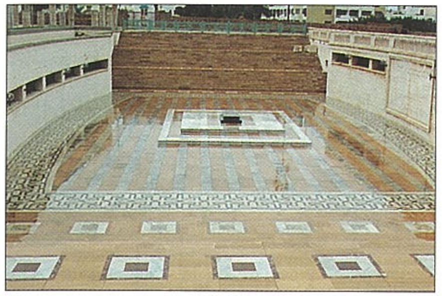
The single shape in this pattern from the Alhambra in Granada is set in two directions.



This pattern also uses a single tile which is set in two directions. It comes from the Brighton Museum and Art Gallery. This is a Victorian building which, in common with the Brighton Pavilion, was strongly influenced by Islamic architecture.

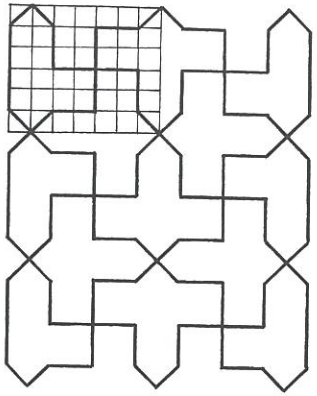


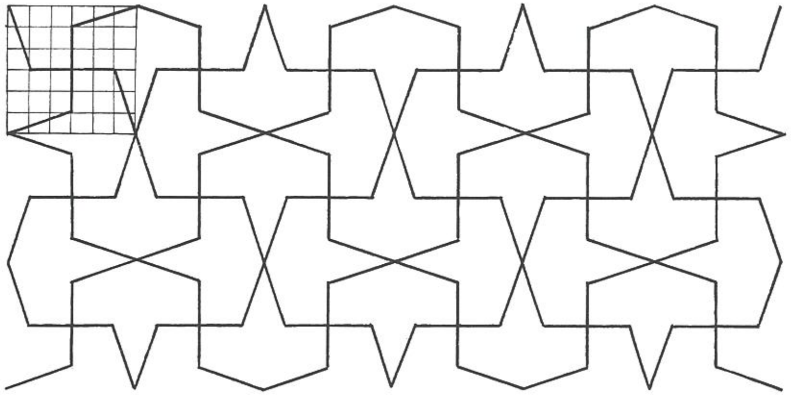
This simple step and repeat pattern comes from the Casa de la Condesa de Lebrija in Seville. The angles are all either 90°, 135° or 215° so the shapes will fit together without rotation.



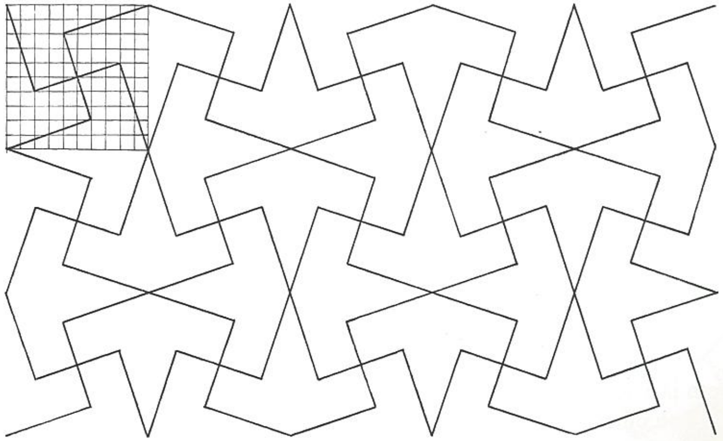
Rabat, Morocco

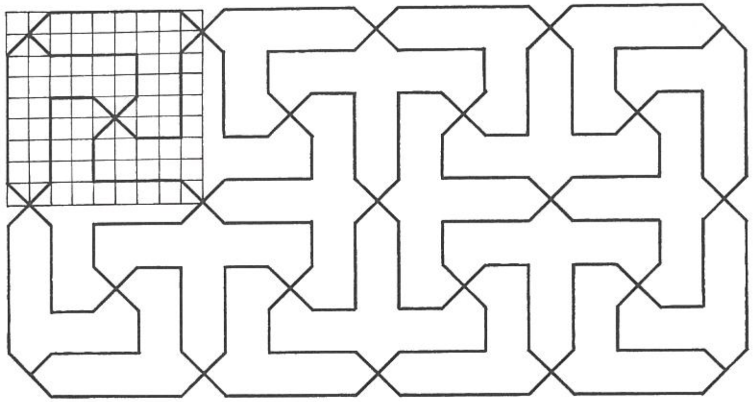
This pattern is from a frieze on a marble floor at the Mausoleum of Mohammed V at Rabat in Morocco.



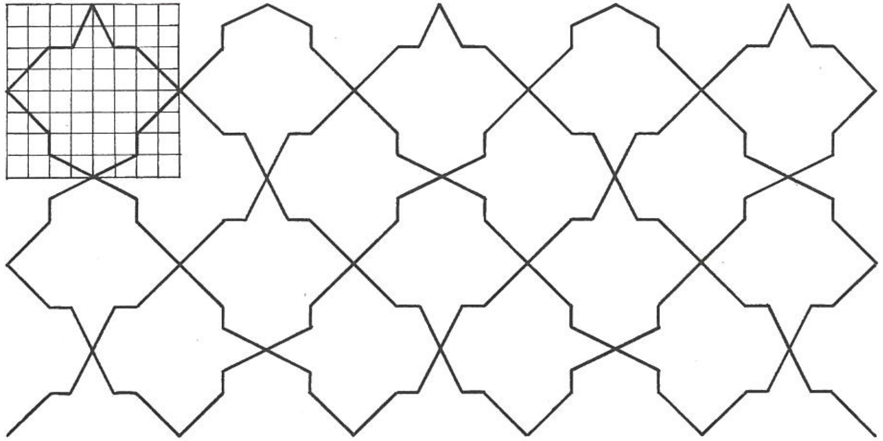


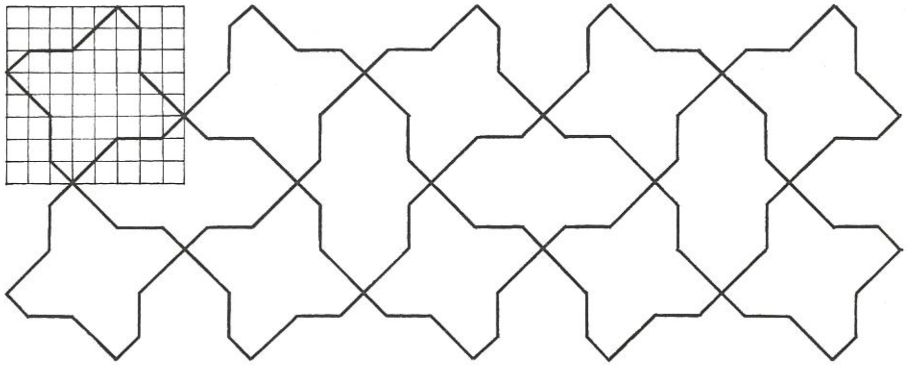
The pattern above is from a Tomb Tower at Kharraqan in Iran and the one below from the Alhambra Palace in Granada.



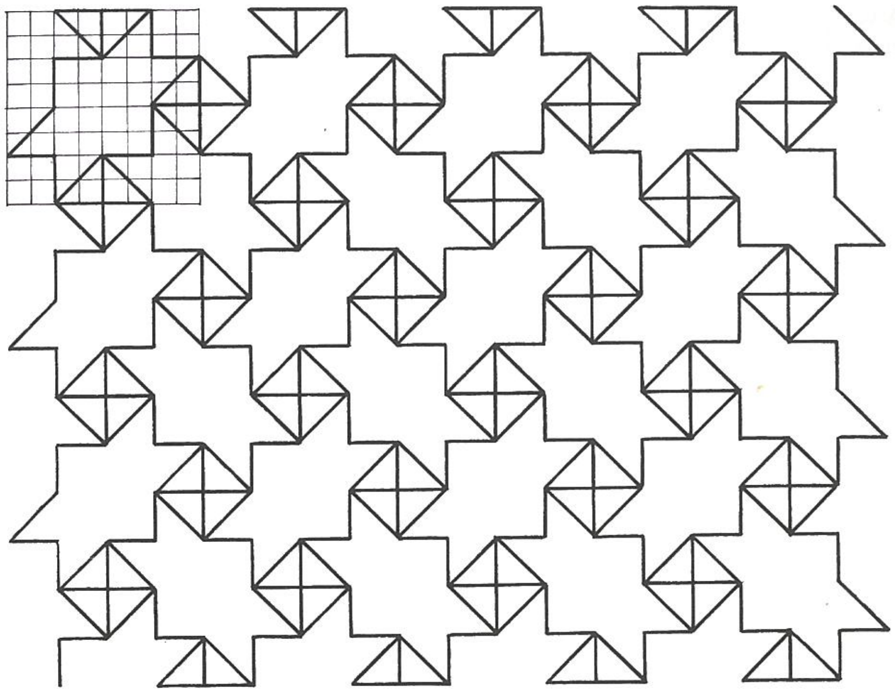


Two further patterns which use tiles of a single shape. The one above is from a house in Cairo and the one below from the Alhambra Palace.

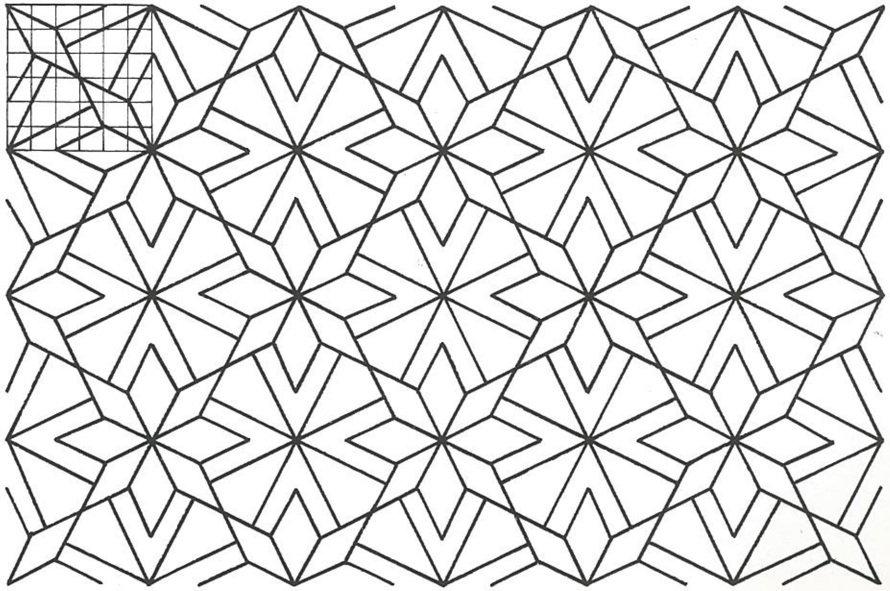




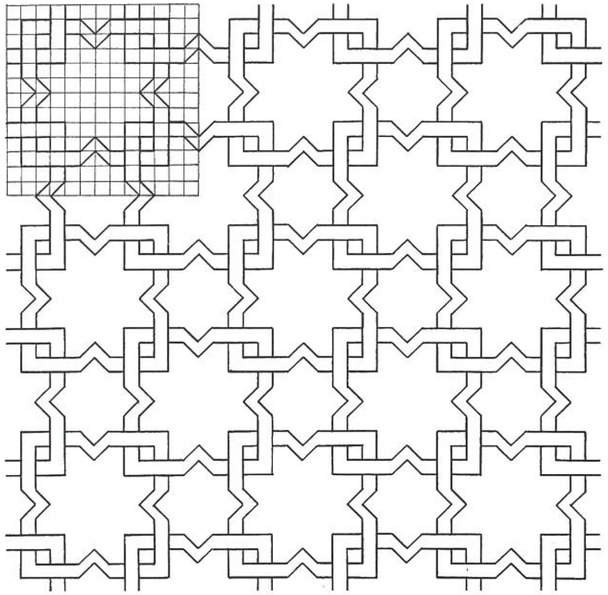
This pattern is also from the Alhambra. However, it uses pairs of tiles which are mirror images of each other, leaving an interesting shape between them.

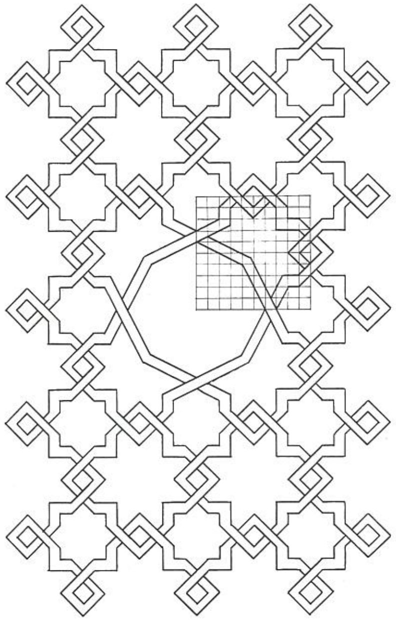


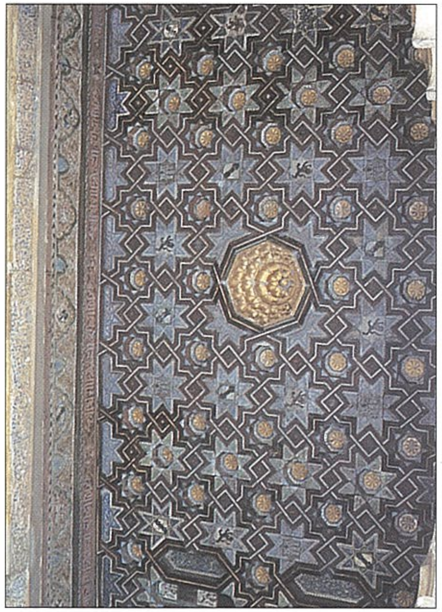
Two tiling patterns, one from the Alhambra in Granada and below from the Bardo in Tunis.



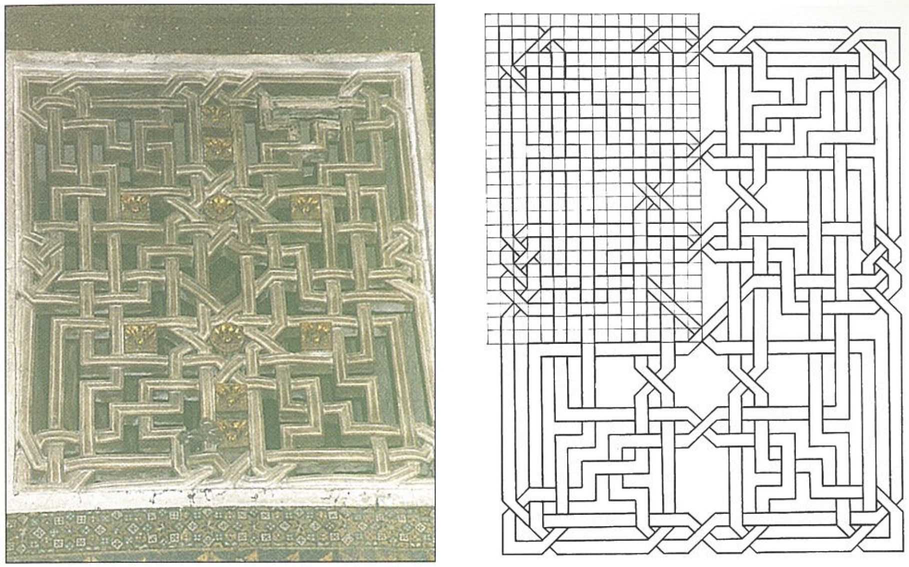
A very interesting technique is to create the shapes out of interlacing bands. It is used a great deal in Islamic art in all sorts of materials. The examples on this page are both from ceilings. First a stucco ceiling from the Bardo in Tunis and secondly from a carved wooden ceiling in the Alcazar in Seville.





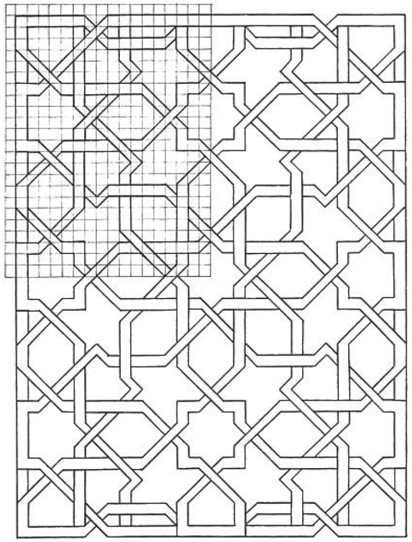


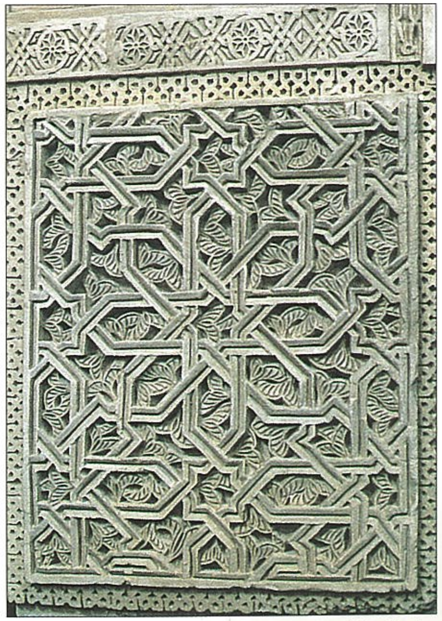
Alcazar, Seville



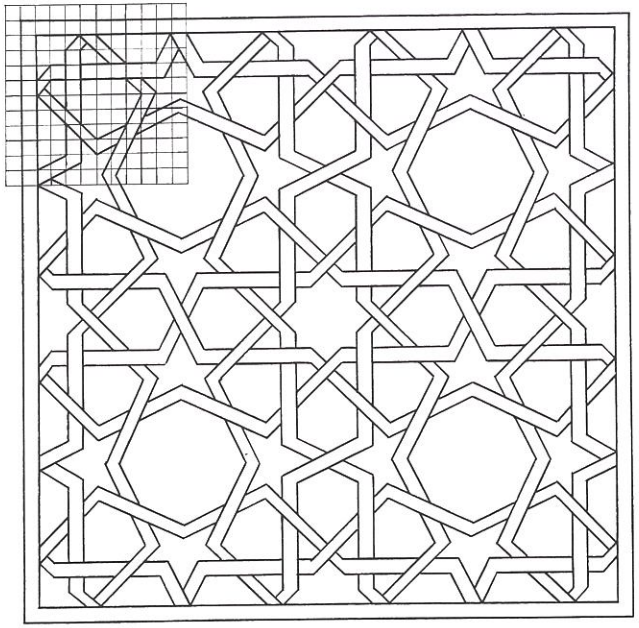
Cordoba, Spain

It is natural to use interlaced band designs for metalwork grills. This one is to be found above the mihrab in the Great Mosque in Cordoba.
Below is a design worked in stucco from the Casa de Pilatos in Seville.

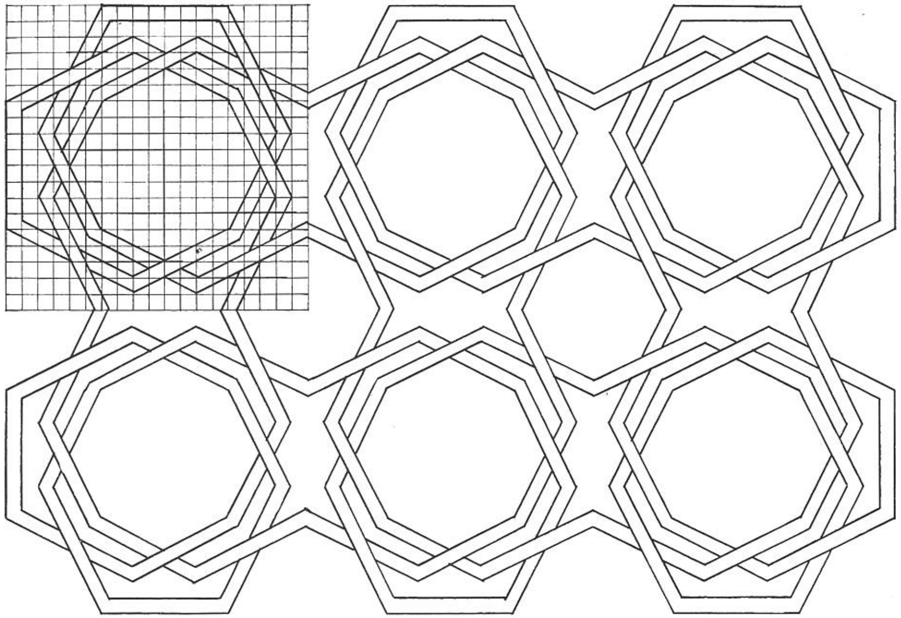




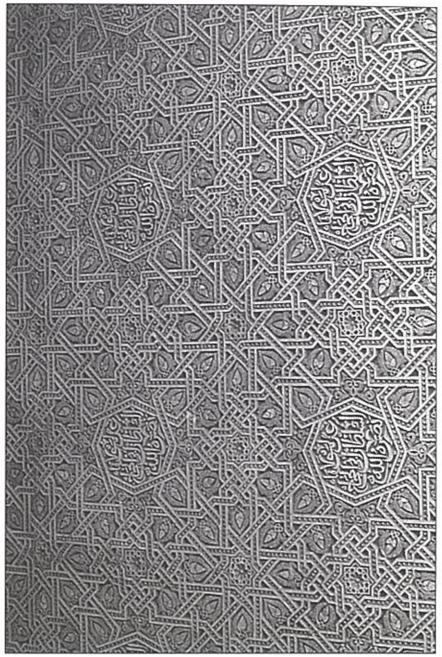
Seville, Spain



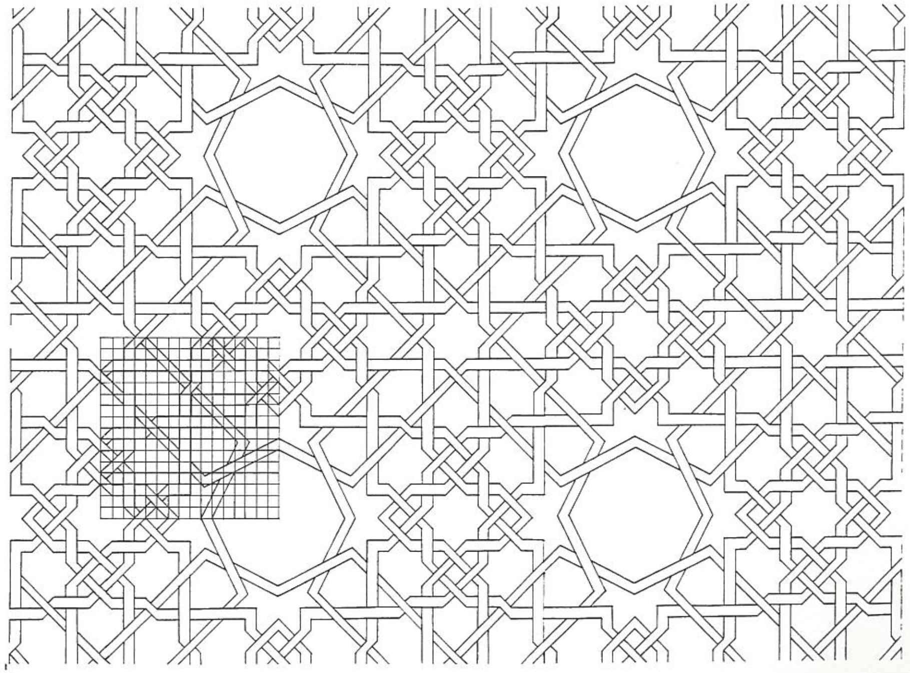
Both these interlaced designs come from manuscripts. The first from the frontispiece of an illustrated Qu'ran (Koran) kept in Geneva, and the second from one painted in Baghdad and now in the Chester Beatty Library in Dublin.



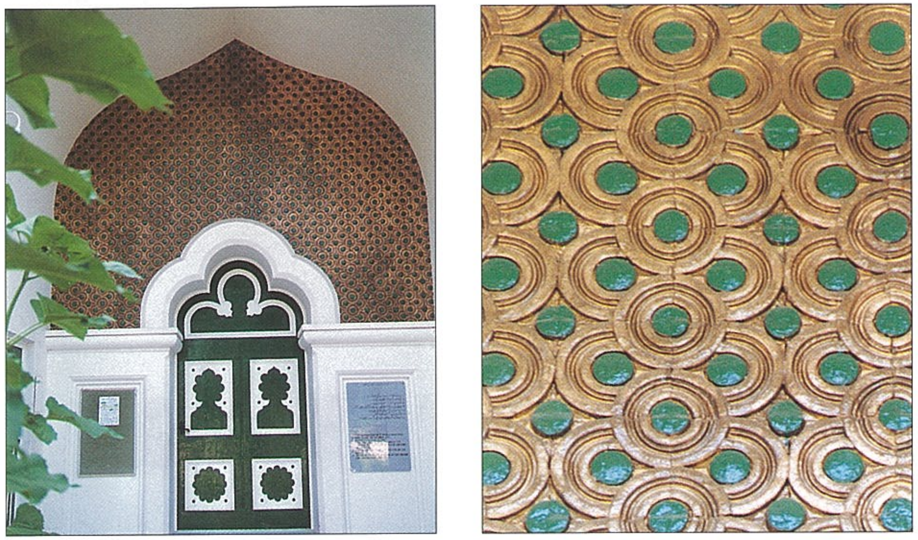
To fully appreciate this design from the Court of the Myrtles at the Alhambra look first at the rows of squares, set obliquely. Then observe how they are linked in two different ways to produce large octagons and smaller eight-pointed stars. The drawing below simplifies it a little and makes it easier to see the structure. In reality, the octagons are filled with further delicate tracery.



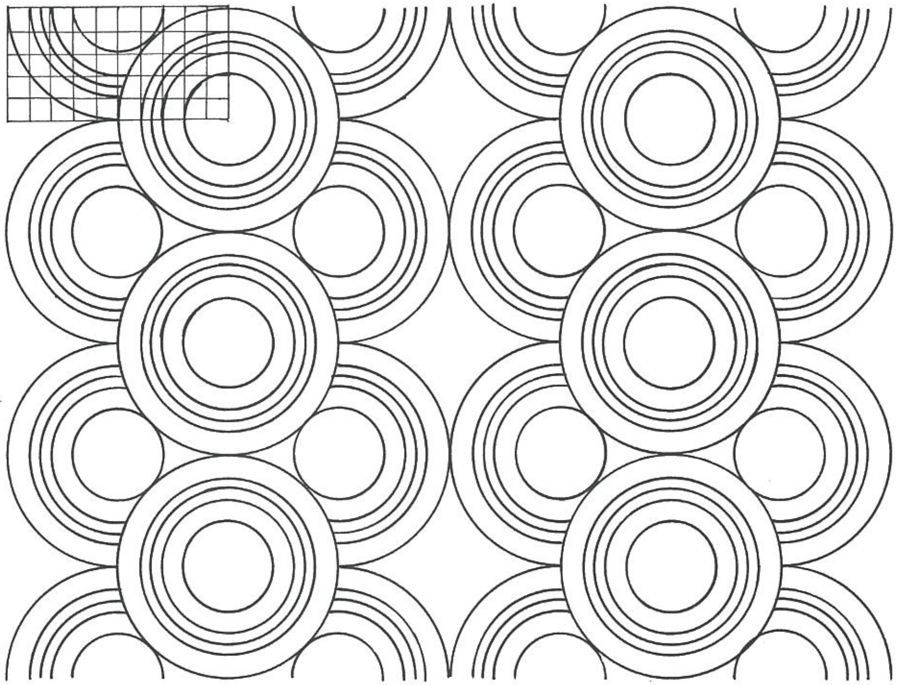
The Alhambra, Granada.



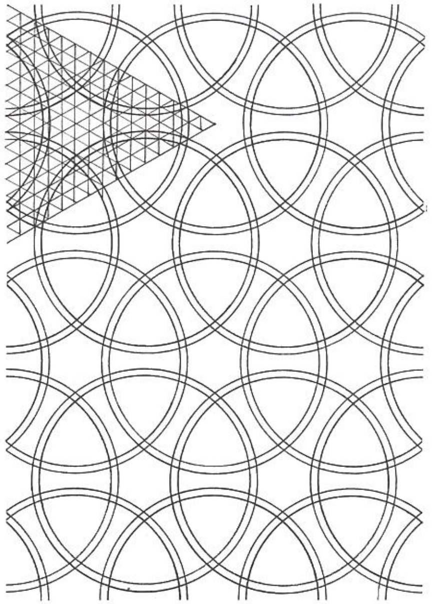
The next four pages are devoted to patterns of circles in various materials. Below is a pattern of square tiles producing the effect of overlapping circles. It comes from the oldest mosque in Britain, the Shah Jehan Mosque in Woking, Surrey. It was built in 1889.

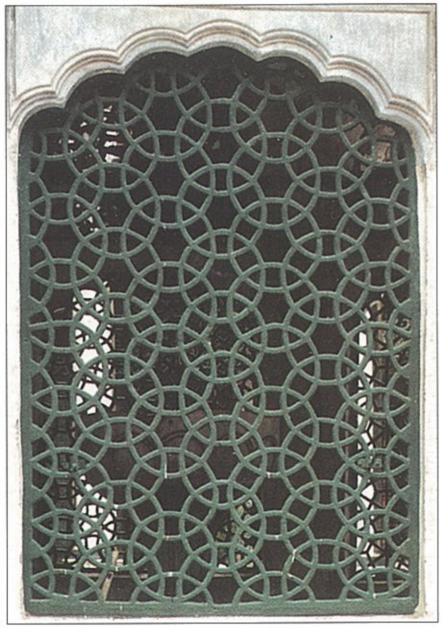


Shah Jehan Mosque, Woking

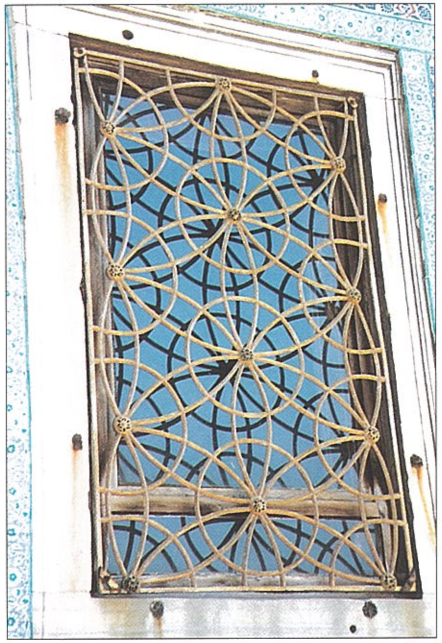


These two designs for metalwork grills are made entirely from circles. However, their proportions are derived from an isometric grid.

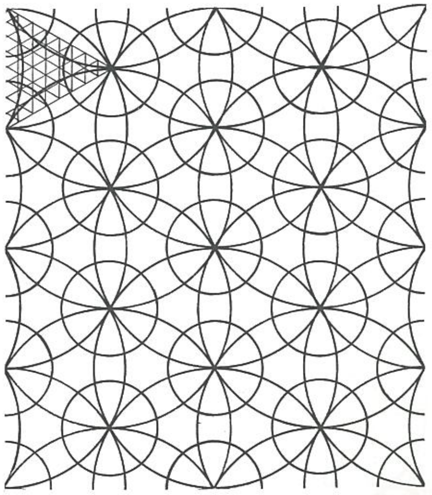




Yeni Cami, Istanbul

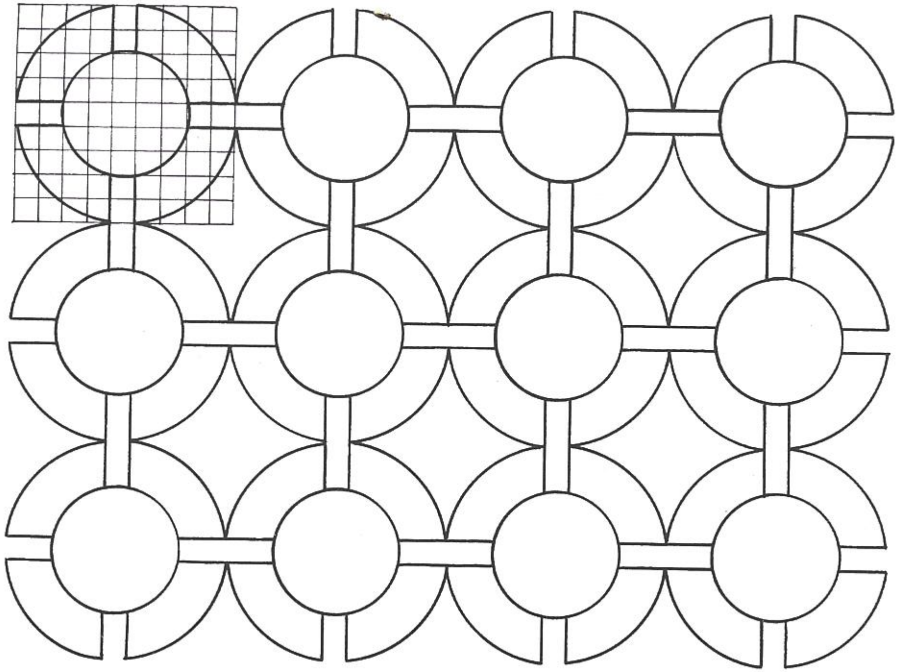


Topkapi Palace, Istanbul

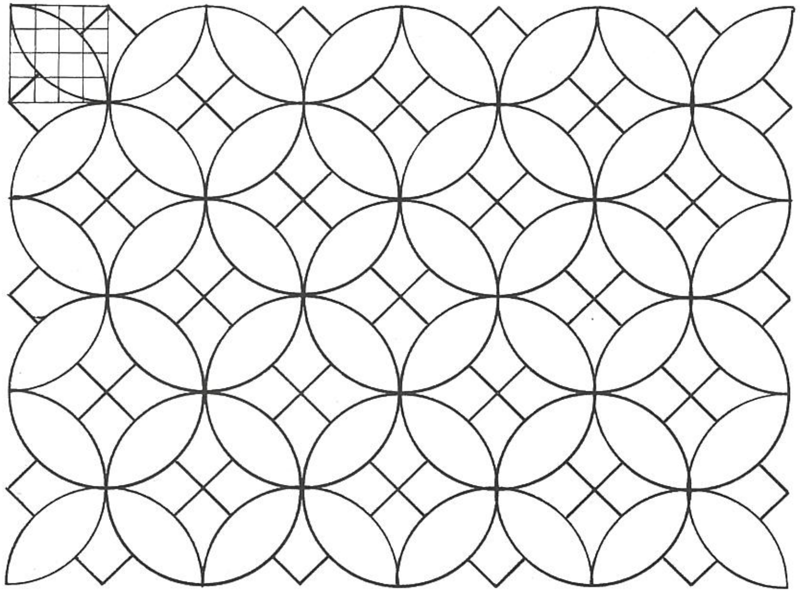


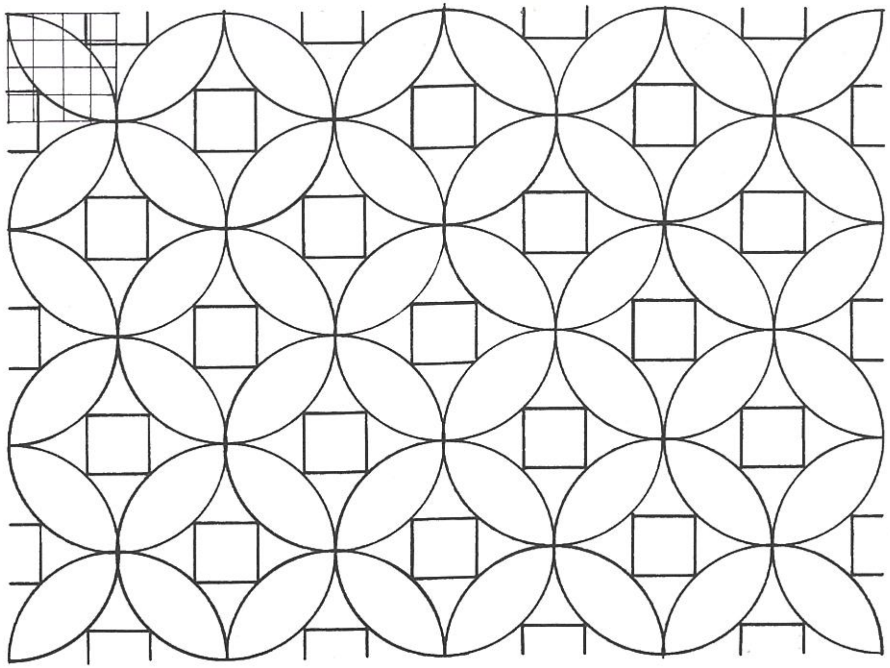
The radii of the smaller circles are three eighths of the radii of the larger.

44916

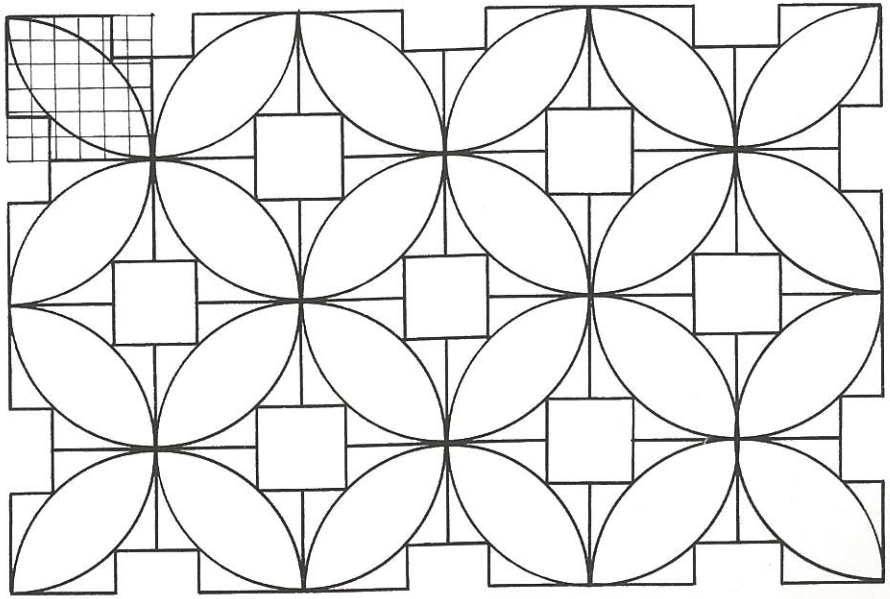


The design above is from a painted ceiling at Zabid in Yemen. The one below is a window grill from the National Museum in Sana'a in Yemen.

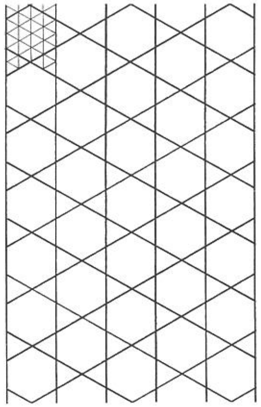


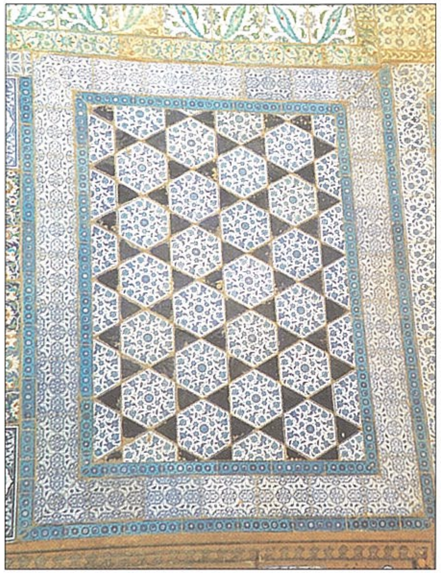


These two designs for window grills are very similar but the one above is from the National Museum at Sana'a in Yemen and the other from the Great Mosque at Cordoba.



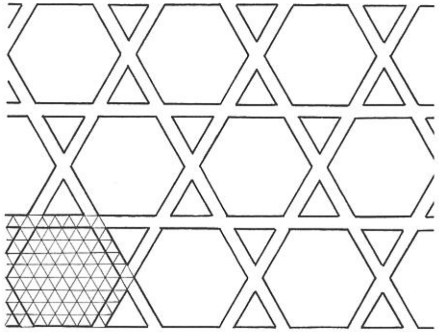
All the remaining patterns until the end of the book are derived from an isometric grid. Apart from equilateral triangles, many of the designs include hexagons and six-pointed stars.





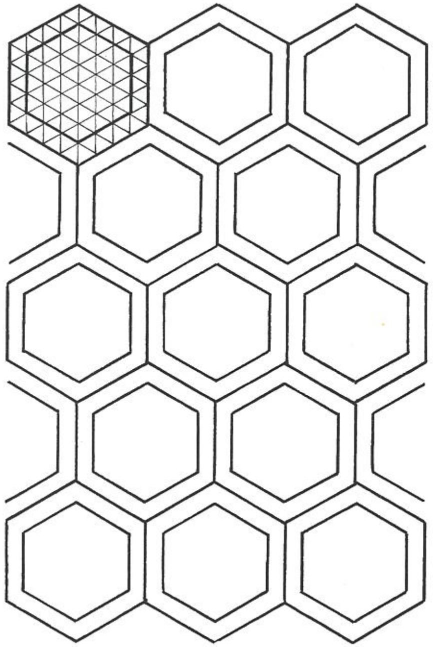
Topkapi Palace, Istanbul

This first pattern is the classic semi-regular tiling of hexagons and triangles set within a wide border from the Topkapi Palace in Istanbul. Each triangle is surrounded by three hexagons and each hexagon is surounded by six triangles.

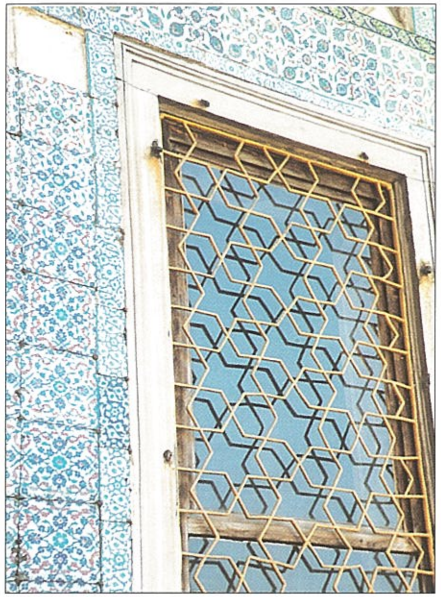


The design above is from a pierced marble screen from the entrance to the mausoleum at the Qala'un complex in Cairo.

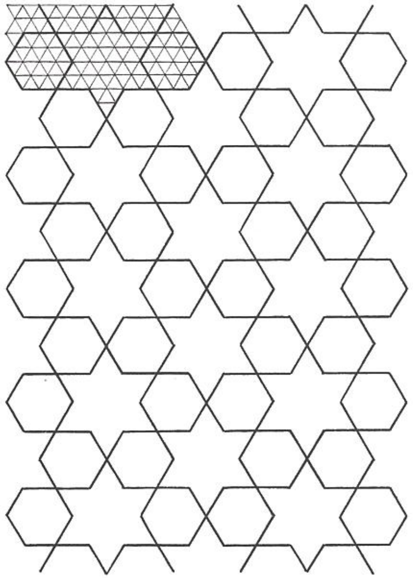
On the right is an Iranian tiling pattern from the British Museum. It is a simple development of a tessellation of hexagons.

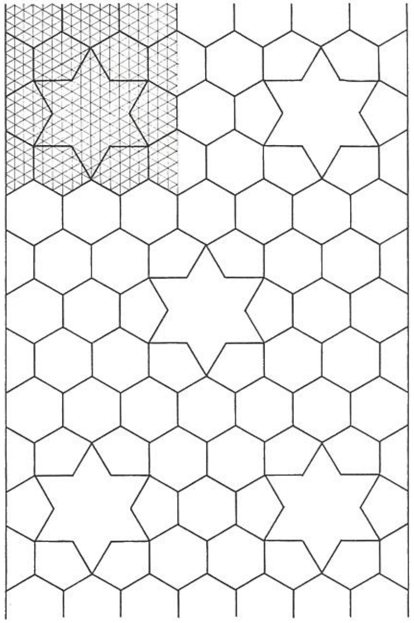


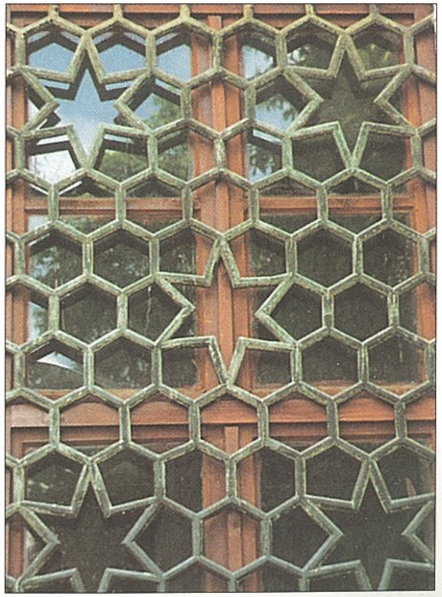
Both the designs on this page are from Turkish metalwork window grills. In the upper one, the six-pointed stars arise from within a pattern of hexagons. In the lower one, they are surrounded by symmetrical pentagons extracted from the isometric grid.



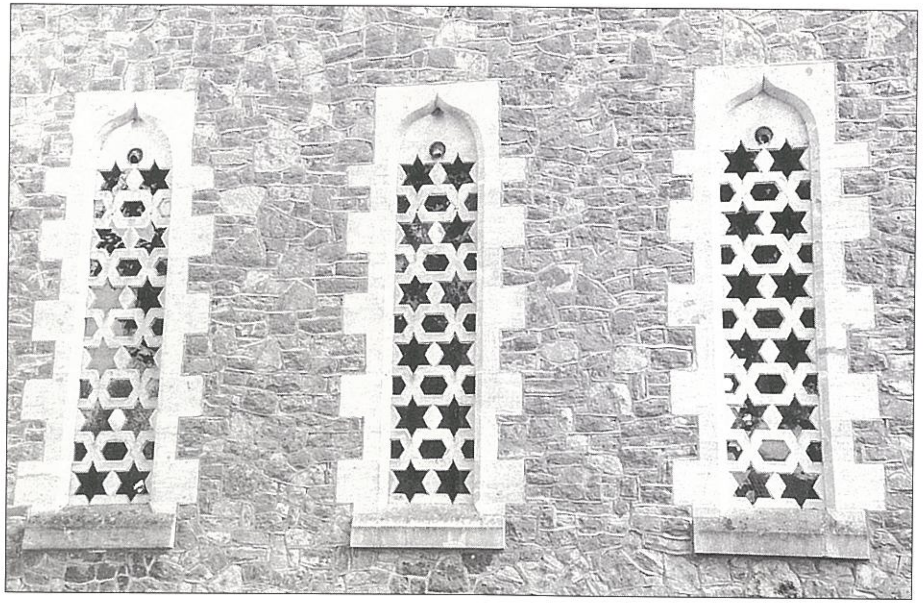
Topkapi Palace, Istanbul





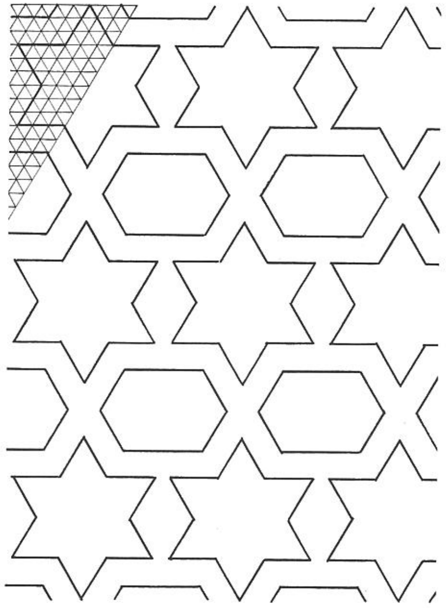


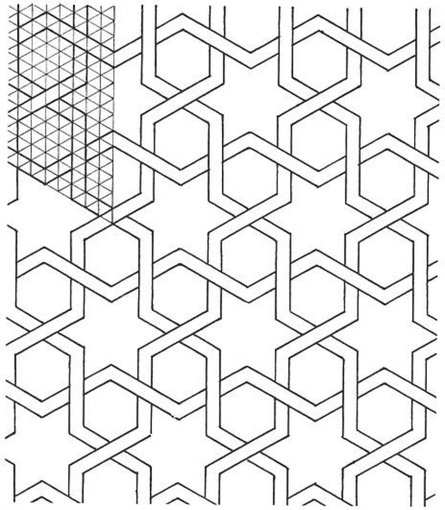
Mausoleum at Hagia Sophia, Istanbul



Shah Jehan Mosque, Woking

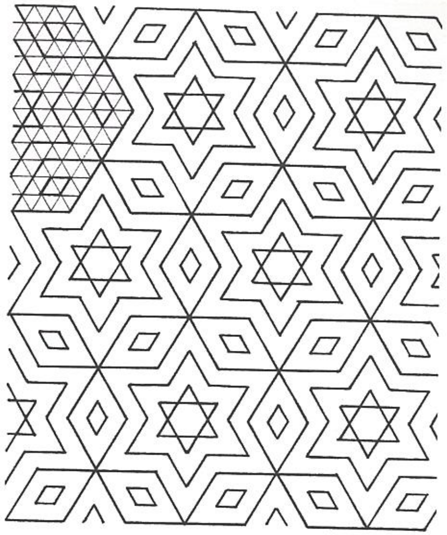
The three windows above illustrate small portions of a pattern of which pairs of stars are the dominant feature. It is a very appropriate section of a pattern which can be extended for ever across the plane. Below left, is a drawing of a larger section of it.

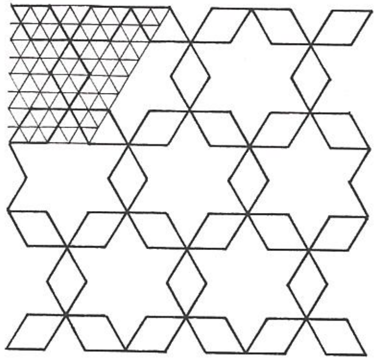


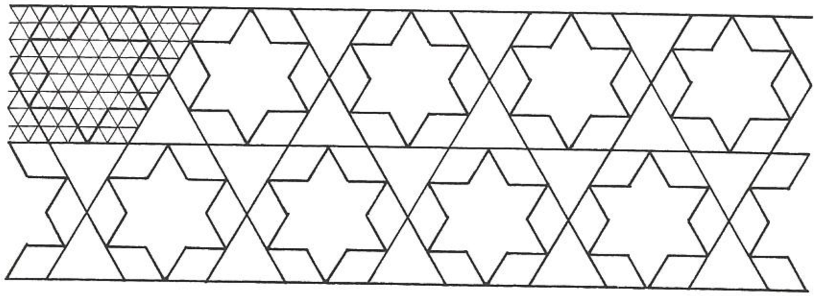


This pattern is from a plaster moulding around the mosaics at the Ghaffariyya Tomb Tower at Maragha, Iran.

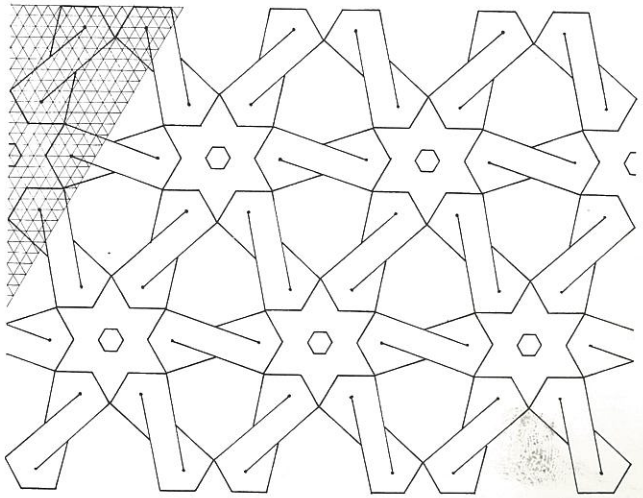
All the patterns on this page include six-pointed stars and they are collected from a wide variety of different sources. The design on the right is now in the Chester Beatty Library, Dublin and the one below is from Gurgan in Iran.

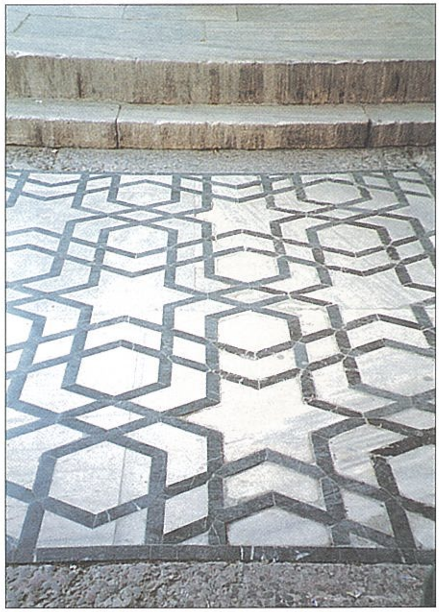




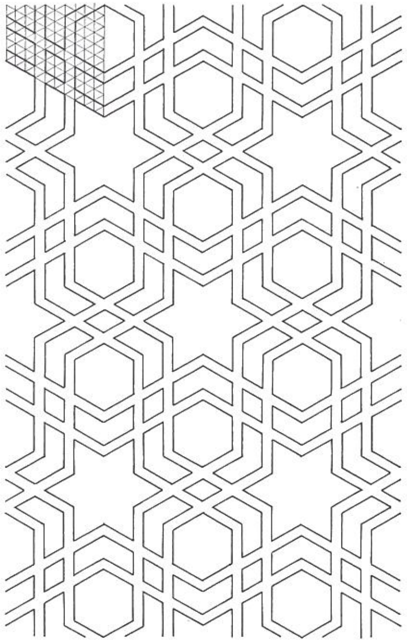


The pattern above is from Konya in Turkey and to the right is a carpet design which can be seen in a miniature painting in the Topkapi Palace in Istanbul.

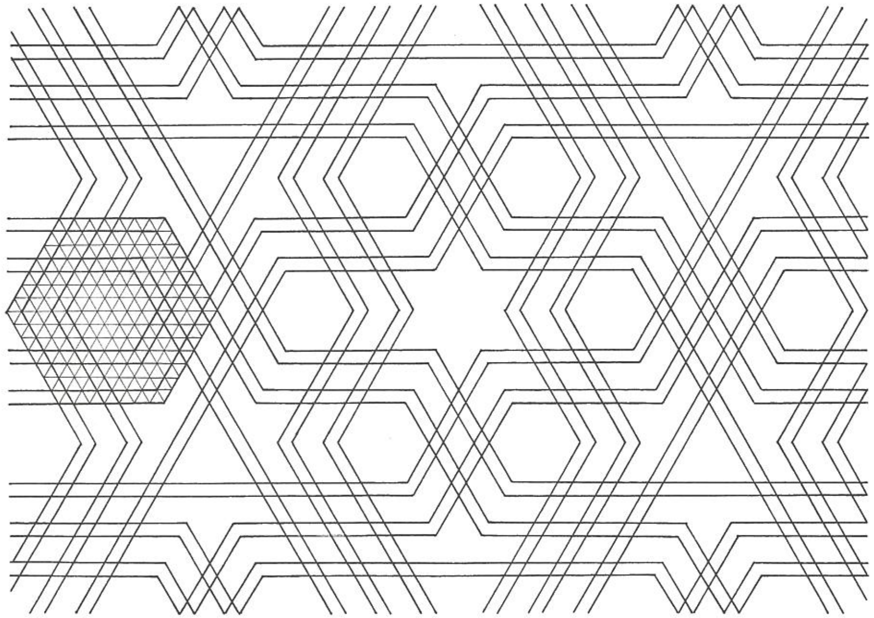


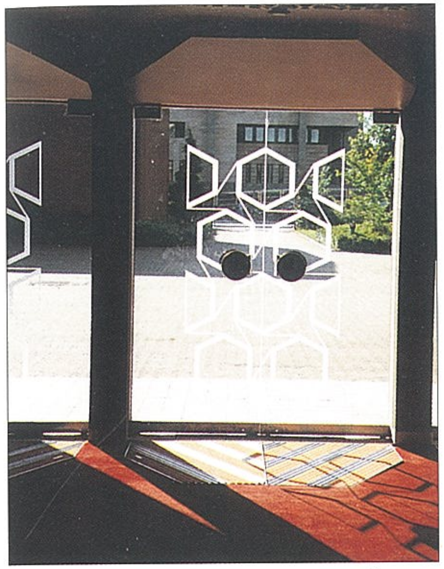


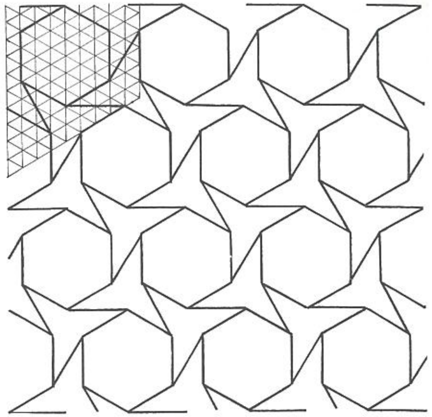
Blue Mosque, Istanbul



Two designs from Blue Mosques constructed around regular hexagons; the first in Istanbul and the second in Tabriz in Iran.

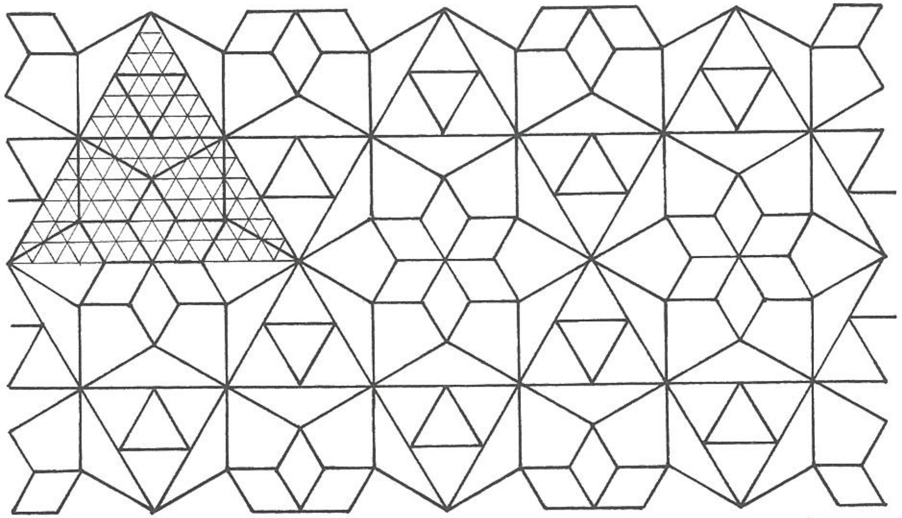






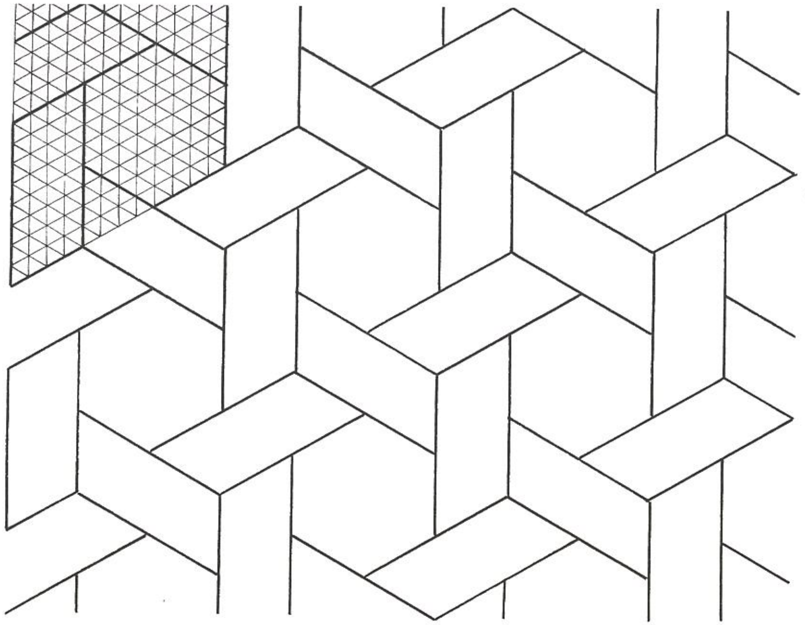
Central Mosque, Glasgow

This arrangement of hexagons and three-pointed stars makes a very elegant and peaceful design for a glass door. It is the spacing between the hexagons on the underlying grid which is critical in producing this effect.

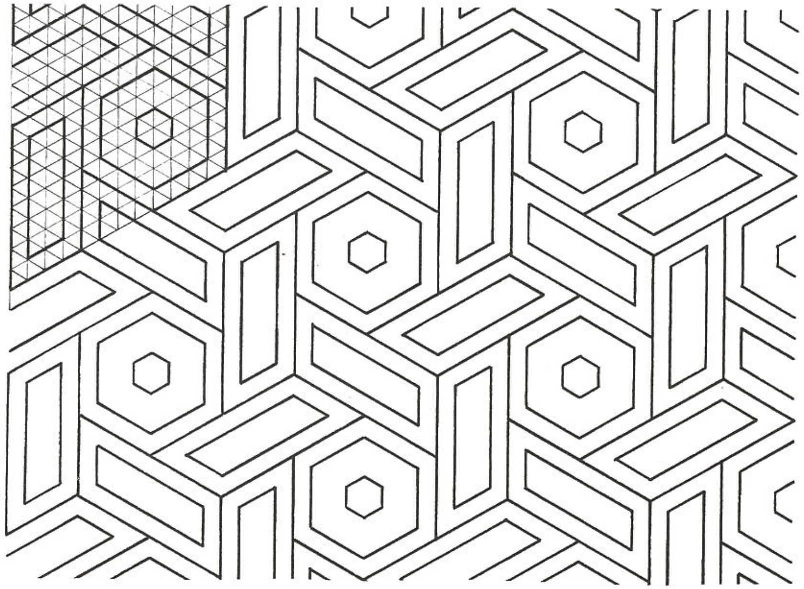


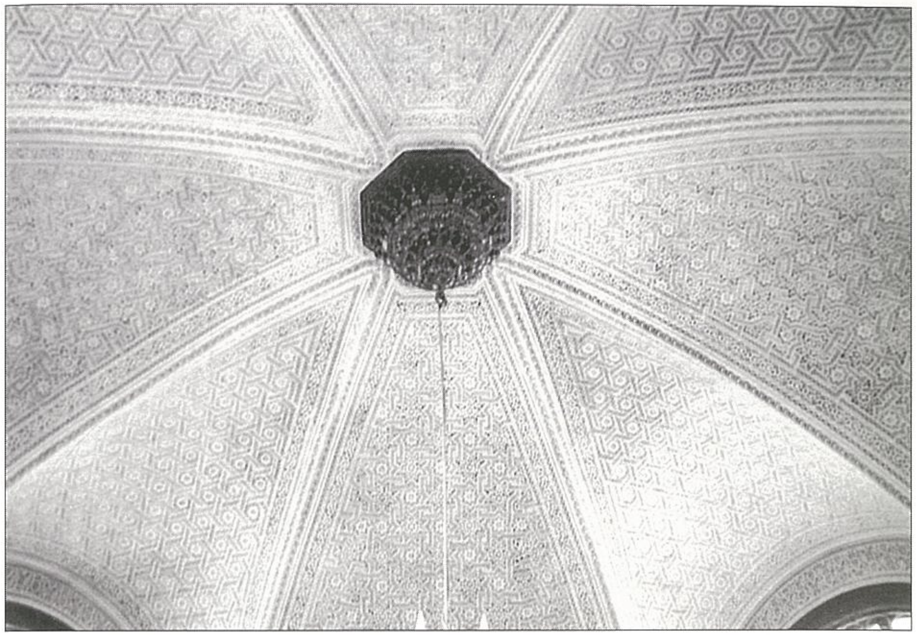
This pattern of marble and mother of pearl inlay is now in the Museum of Islamic Art in Cairo. The six-pointed stars which occur in a row down the centre of the pattern are each made from six 60° diamonds. Look also for the four different sizes of equilateral triangles.

Patterns based on hexagons and the isometric grid can also suggest three-dimensional surfaces, often rather complex ones.

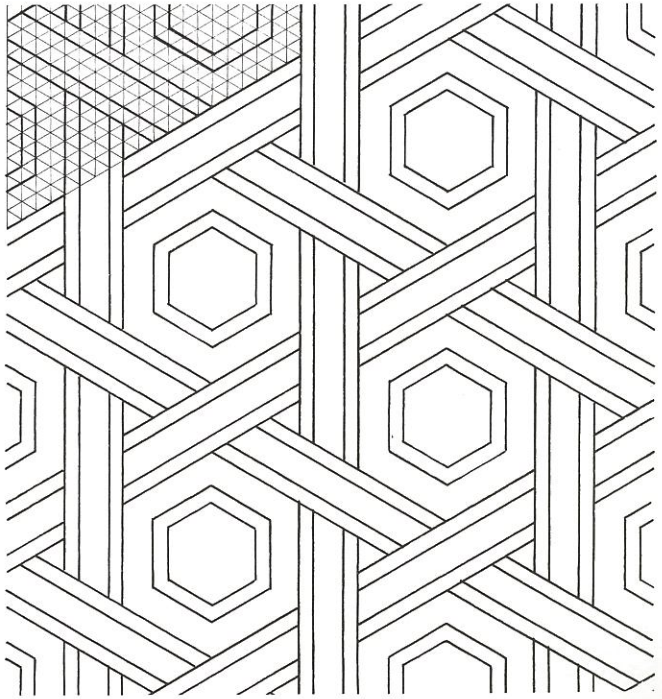


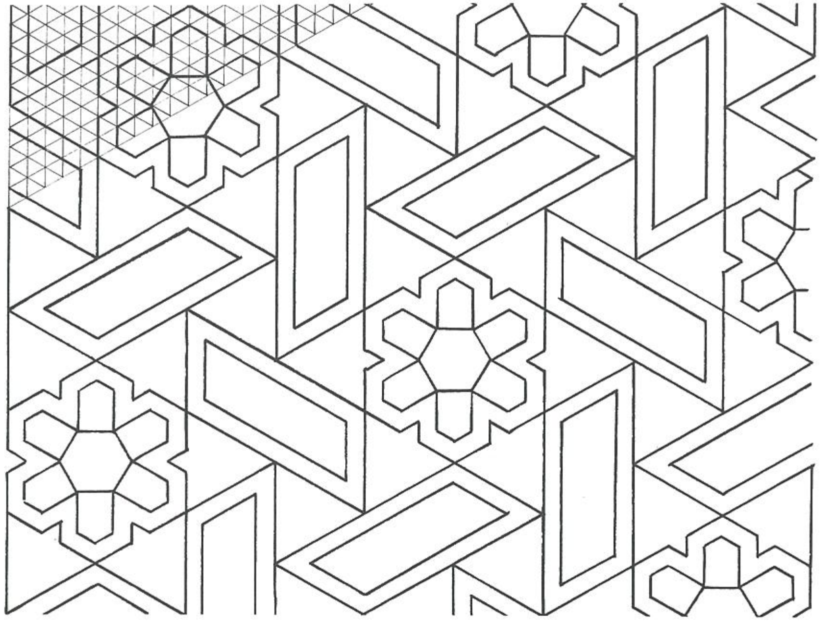
The pattern above is from the British Museum in London and the one below is from the National Library in Cairo.



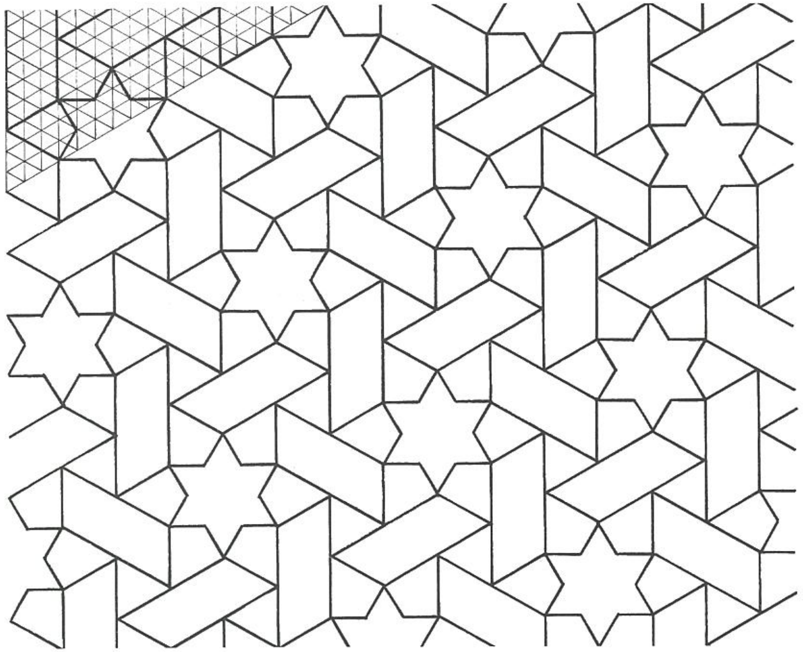


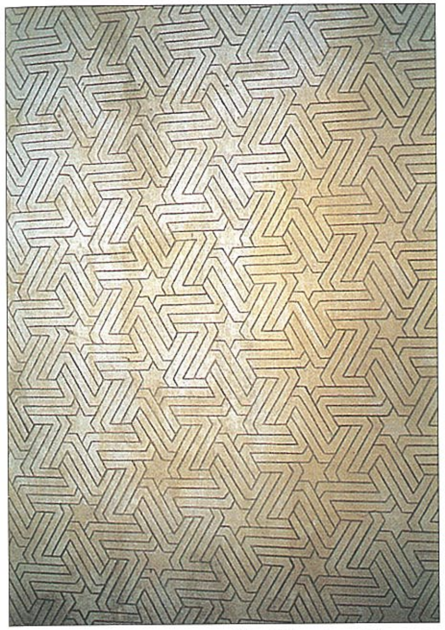
Stucco ceiling, The Bardo, Tunis



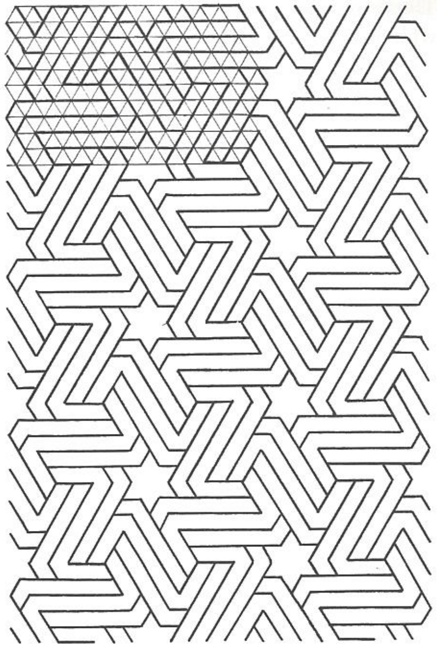


The pattern above comes from a stucco design in the Imamzada Yahya Mausoleum at Varamin in Iran. The tiling pattern below is from the Sirçala Madrassa at Konya in Turkey.

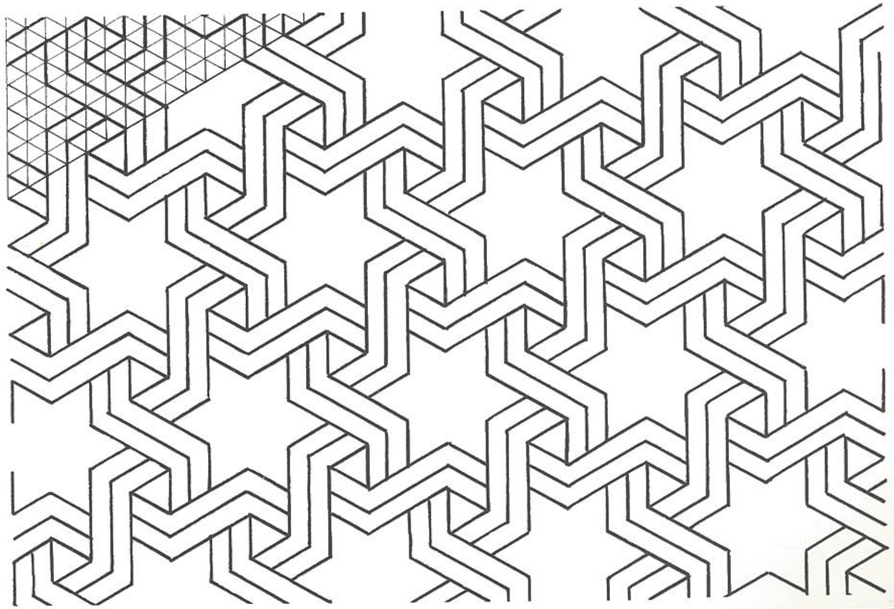




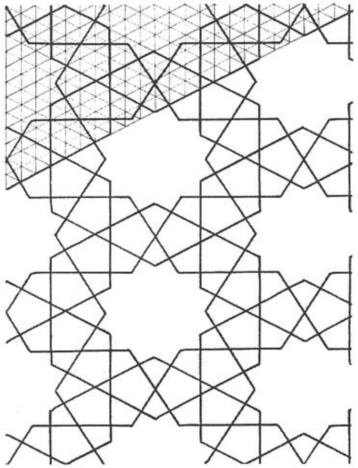
The Alhambra, Granada

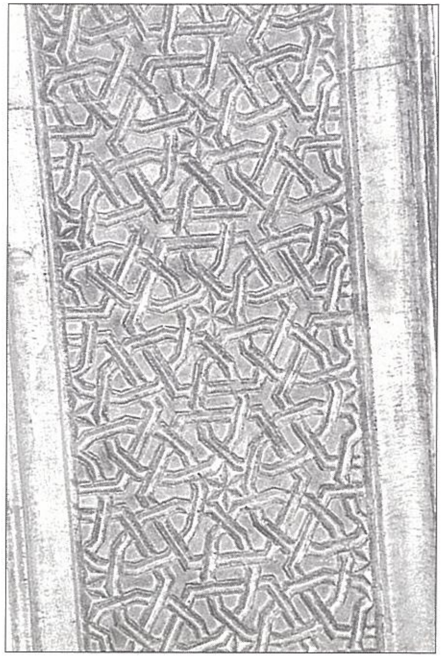


Both patterns on this page were originally produced as wall decorations in stucco; above from the Lion Courtyard at the Alhambra Palace in Granada and below from the Imamzada Mosque in Varamin, Iran.

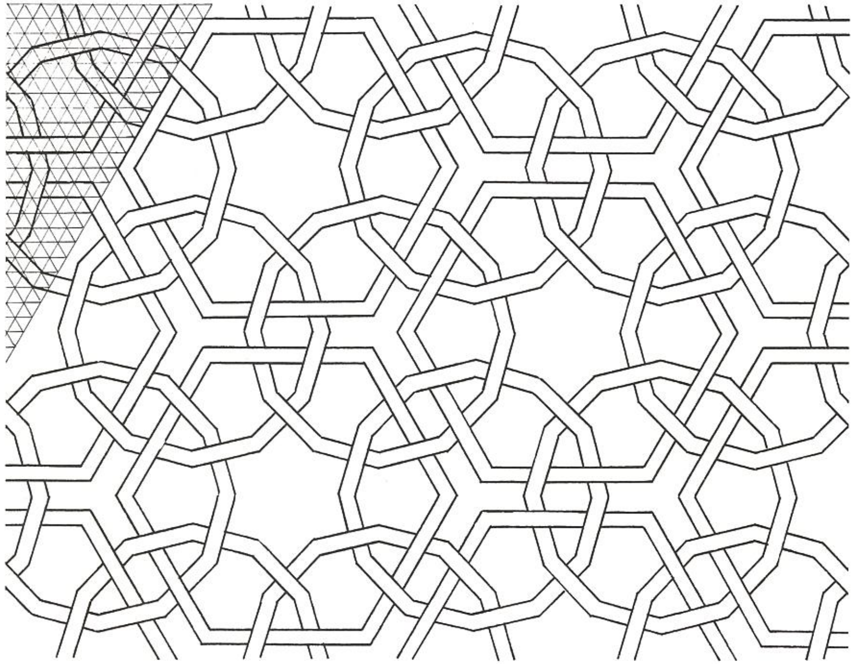


These two pages show how designs which start with hexagons can be developed into different twelve-pointed stars and also into regular dodecagons, shapes with twelve equal sides. Below is a design taken from the Alhambra in Granada.

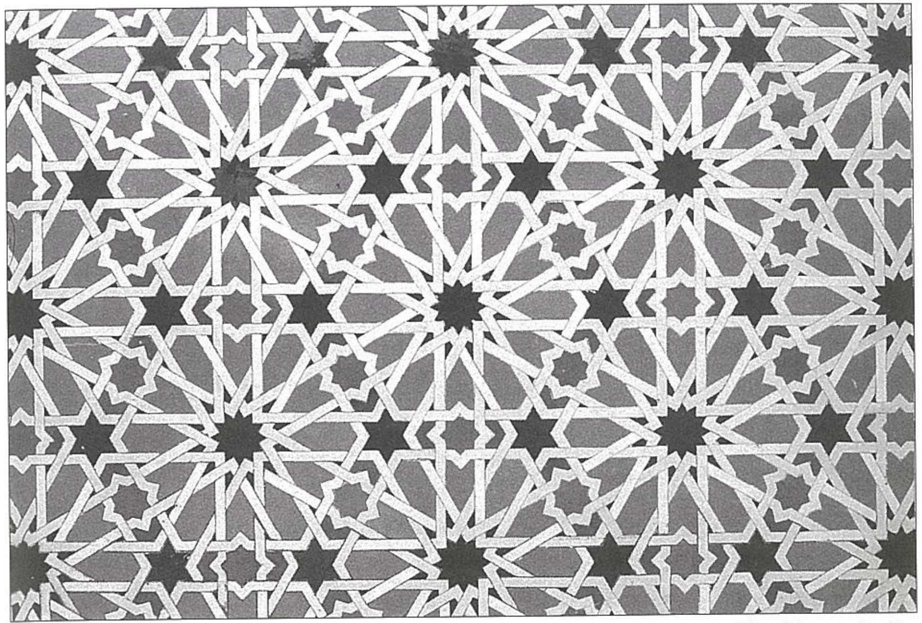




Hagia Sophia, Istanbul



A spectacular interlacing pattern which produces both twelve-pointed and eight-pointed stars in hexagonal arrangements.



The Alcazar, Seville